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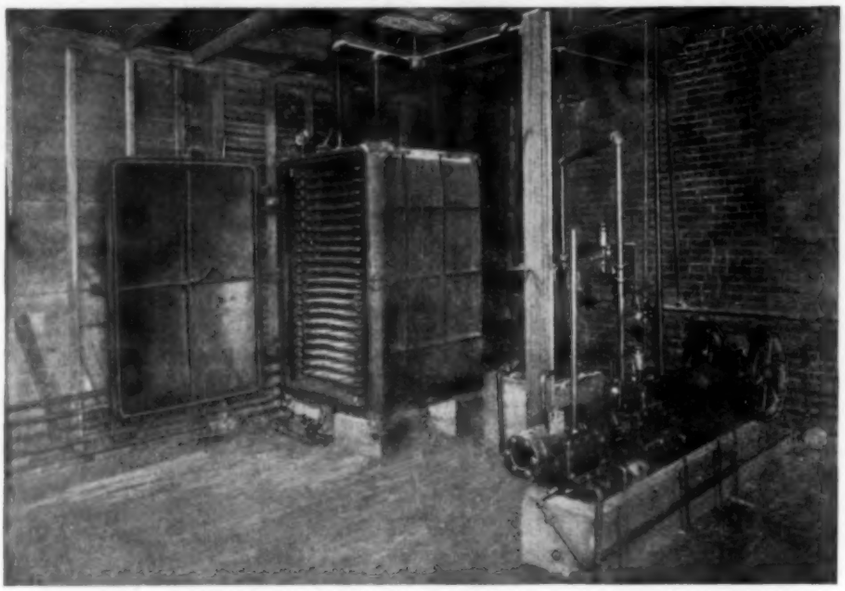

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Chemical Examination of Antimony Sulphides

By A. Van Rossem and P. Dekker

When investigating the quality of a sample of antimony sulphide, it is desirable to carry out in addition to the chemical analysis, heating tests, or still better, vulcanization experiments, in order to investigate whether the desired color remains after curing.

However, it is intended to deal here only with the chemical analysis.

Antimony sulphide has mostly been taken erroneously as an accelerator, but Weber[1] has already pointed out that pure antimony pentasulphide does not possess any accelerating properties, and that this action must be exclusively attributed to the free sulphur present. Apart from greatly varying quantities of free sulphur, there is sometimes present calcium sulphate, which may be due to the process of manufacture. Further, there may be present antimony trisulphide for obtaining the desired shades, and then adulterations such as infusorial earth, kaolin, and iron oxide, which must be considered as worthless.

Consequently when making the analysis of a sample, the percentage of antimony pentasulphide, and moreover that of the free sulphur, are of much importance. For when using antimony sulphide in rubber mixtures, the manufacturer will have to take the quantity of free sulphur carefully into account. The determination of calcium sulphate and eventually added adulterations may also be of importance.

Six samples of antimony sulphide have been subjected to a chemical investigation, whereby at first the method proposed by Weber and Sweet[2] and mainly followed by Repony[3] was adopted. In the course of the tests it became evident that these methods are disappointing, and by no means conducive to a satisfactory solution. A modified method for the analysis had to be found, and the following paragraphs give the result.

Analysis of Antimony Sulphide According to the Methods of L. E. Weber-Sweet and Repony

The following determinations are to be made according to these methods:—

(1) Degree of acidity; (2) free sulphur; (3) moisture and water of crystallization; (4) calcium sulphate; (5) adulterations.[4]

(1) Determination of the degree of acidity.

Weber and Sweet boil 5 gr. of the sample with 200 c.c. water during 20 minutes and titrate the filtrate with o, 1 N. sodium hydroxide, while Repony washes 2 gr. of the sample with cold water and the filtrate is titrated with o, 1 N. sodium hydroxide. The results are little at variance, and give no opportunity for particular remarks.

(2) Determination of free sulphur.

Weber and Sweet extract by repeated cold washing with carbon bisulphide. Repony extracts in a Soxhlet apparatus, boiling with carbon bisulphide for 10 hours. The results of both methods are laid down in Table I.

Determination of the free sulphur in antimony sulphide by extracting with carbon bisulphide.

TABLE I.

FREE SULPHUR IN PER CENT.

No. of Sample	Hot extraction in Soxhlet	Cold Extraction
1.	14.1	13.1
2.	6.1	4.8
3.	10.5	9.6
4.	0.1	0.1
5.	40.0	39.2
6.	32.5	32.0

As can be seen the hot extraction yields higher results, but this difference is not important. As to the accuracy of the method for determining the free sulphur, there seems to exist the most striking contradiction in literature. For instance, C. O. Weber[5] states positively that antimony pentasulphide is decomposed on being extracted with carbon bisulphide sulphur being withdrawn. He therefore considers this method impracticable, and has suggested another way, which will be dealt with in Section 3.

Other investigators, such as Caspari[6] and Dubosc[7], maintain that the decomposition by carbon bisulphide can be neglected.

Other organic solvents of sulphur have been recommended as media for extracting, such as acetone, but in this case it has been stated in literature that acetone would decompose antimony pentasulphide.[8] Consequently it was found desirable to investigate whether the figures found with carbon bisulphide are indeed the percentage of free sulphur present in antimony sulphide, or whether they are too high on account of partial decomposition. That the latter is really the case will be proved in Section 4.

(3) Determination of Calcium Sulphate.

Repony states that 1 gr. of the residue of the bisulphide extraction is to be washed with water and this filtrate evaporated in a weighed dish. Weber and Sweet had already indicated this *modus operandus*, but pointed out that this method is only available when impurities soluble in water are absent.

At the Institute filtrates of 5 samples were qualitatively tested which showed that besides calcium sulphate, antimony compounds were also present. Moreover, sodium compounds could be traced in the water extracts of samples Nos. 1, 2 and 5, whereas in sample No. 2 magnesium compounds were also indicated.

Consequently the calcium compounds were precipitated as oxalate and determined as calcium oxide, while the soluble antimony compound was determined as antimony sulphide. The results can be seen from Table II.

TABLE II.

WATER EXTRACTION OF ANTIMONY SULPHIDE.

No. of Sample	Water Extract.	Calcium Sulphate Calculated from CaO per cent.	Antimony as Trisulphide per cent.
1.	4.6	1.2	0.7
2.	11.1	4.1	1.5
3.	19.0	17.2	1.1
4.	3.3	2.8	0.4
5.	15.5	7.3	0.9

India Rubber Journal, London, England
[1] The Chemistry of India-Rubber (London, 1902), p. 185.
[2] Le Caoutchouc at la Gutta-Percha 15, 9468 (1918).
[3] India-Rubber World, 60, 370 (1919).
Particulars as to the modus operandi are to be found in the articles cited.
[5] l. c.
[6] India-Rubber Laboratory Practice (London, 1914), p. 75.
[7] Le Caoutchouc et la Gutta-Percha 13, 8886 (1916).
[8] Dubosc l. c.

Hence determining calcium sulphate by extracting with water gives erroneous results.

(4) Determination of moisture and water of crystallization.

According to Repony, 1 gr. of the residue from the extraction with carbon bisulphide is dried during 6 hours at 100 degrees. The difference in weight is the moisture. This method lacks all possible value. First of all, after the extraction, the material was dried at 60 degrees C., thus causing the moisture to disappear for the main part. And in regard to the water of crystallization one has only to refer to the well known fact that at 120 degrees C. three-fourths of the water of crystallization is expelled from calcium sulphate according to the following equation:—

$$2CaSO_4 \cdot 2H_2O \longrightarrow 2CaSO_4 \cdot 1H_2O + 3H_2O$$

Only when heating at 300 degrees C. $CaSo_4 \cdot 2H_2O$ loses all its water of crystallization.

(5) Determination of Adulterations.

Different investigators determine possible adulterations by treating the antimony pentasulphide with caustic potash or soda solution, causing thereby such impurities as kaolin, iron oxide and such like to remain behind. So, for instance, Repony states that after extraction with carbon bisulphide and water, the remaining part was brought to dissolve in 10 per cent caustic soda solution on the water bath. At the Institute five samples were tested in this way. From this it appeared that when the heating on the water bath was prolonged, the quantity of insoluble material became greater. So for instance, a sample having been extracted with carbon bisulphide, yielded on being heated on the water bath after ten minutes an insoluble residue at 5.4 per cent, but after being heated twenty minutes 11.2 per cent. The percentage of antimony calculated as trisulphide, amounted to respectively 2.8 per cent and 5.4 per cent, from which it is apparent that a part of the soluble antimony compounds is again separated on prolonged heating with caustic soda. This is in confirmation of the observations in literature, which state that on dissolving antimony pentasulphide in caustic soda solution, insoluble $NaSbO^3$ is formed.[9]

The insoluble part of the samples Nos. 1 to 5 was yellowish white, and was entirely soluble in hydrochloric acid, which proved that none of the samples tested contained adulterations insoluble in acid, which is of importance for our further investigations. In order to state the nature of the adulterations, it will be desirable to carry out a qualitative analysis of the part insoluble in caustic soda solution and if desired to determine some of the compounds quantitatively.

The Method of C. O. Weber for Determining the Free Sulphur

As already stated, Weber was of the opinion that the extraction method for determining the free sulphur was impracticable. He treated antimony sulphide with strong ammonia heated gently on the water bath, whereby all antimony pentasulphide dissolved and the free sulphur remained. The solution was then filtered in a Gooch crucible, washed out with ammonia, and dried at 60 degrees C., after which the contents of the crucible were extracted in a Soxhlet apparatus and the extracted sulphur weighed.

We tested this method by starting work exactly as stated by Weber, and gently heating the antimony sulphide with strong 25 per cent ammonia solution on the water bath. In doing this a part of the ammonia evaporates, and in consequence part of the antimony pentasulphide is again precipitated, causing the red color to reappear.[10] Preliminary experiments also made it evident that the concentration of the ammonia is of importance for the results. In order to test this more closely a series of tests was made with samples Nos. 1 to 6 with ammonia of increasing concentration, viz., 5 per cent, 10 per cent, etc., to 25 per cent ammonia, working as follows: 1 gr. of the sample was kept with 50 c.c. of the ammonia for one night in a closed flask. With sufficient strength of the ammonia the antimony pentasulphide was dissolved.[11] The insoluble part was now filtered off on a Gooch crucible and dried at 100 degrees C. It was washed with strong hydrochloric acid and then with water, dried, and weighed again. As it was already known[12] that no impurities soluble in hydrochloric acid were present, only free sulphur could remain. In addition this was determined separately by extracting the residue with carbon bisulphide.

The figures from the samples are to be seen in Table III.

TABLE III.

DETERMINATION OF FREE SULPHUR WITH AMMONIA IN INCREASING CONCENTRATION

	Concentration of Ammonia 5%	10%	15%	20%	25%
Sample antimony sulphide No. 1.					
Insoluble part	37.9[1]	25.0[1]	25.4	30.5	31.7
Insoluble residue, after treating with HCl	4.7	3.3	1.8	0.9	0.6
Free sulphur in insoluble residue	4.5	3.2	1.9	0.9	0.5
Sample antimony sulphide No. 2					
Insoluble part	50.1[1]	43.5[1]	43.8	46.8	47.3
Insoluble residue, after treating with HCl	1.9	0.6	0.3	0.2	0.4
Free sulphur in insoluble residue	1.7	0.6	0.3	0.1	0.3
Sample antimony sulphide No. 6					
Insoluble part	47.9	47.6	45.4	42.7	40.5
Insoluble residue, after treating with HCl	28.2	28.0	20.3	14.5	10.4
Free sulphur in insoluble residue	28.1	27.8	20.2	14.0	10.1

[1] Red colour not entirely disappeared; hence part of the antimony pentasulphide had not gone into solution, thus causing the percentage of free sulphur to be too high.

From these figures the following may be concluded:—

(1) The solubility of antimony pentasulphide depends on the ammoniacal solution used, and varies considerably for the different samples. Sample No. 6 already dissolved in 5 per cent ammoniacal solution, No. 2 in 10 per cent, and No. 1 in 15 per cent.

(2) With increasing strength of the ammonia the amount of free sulphur determined becomes less. With Nos 1 and 2 these differences are not very considerable because the quantity of free sulphur is small. No. 6 offers a striking example: When using a 5-10 per cent solution, 28 per cent of free sulphur is found; with a 25 per cent ammoniacal solution we find 10.4 per cent free sulphur.

These results therefore show that the method indicated by Weber in its original form with strong ammonia and gently heating cannot yield good results, as a considerable part of the free sulphur goes into solution.

The question arises whether working with ammonia of such a strength that the antimony pentasulphide is just dissolving, there will be found accurate results for the percentage of free sulphur. From Section 4 it will become clear that this is virtually the case within practical limits.

Indirect Determination of the Percentage of Free Sulphur

Trisulphide[13] being absent, the quantity of antimony pentasulphide can be found by treating the sample with hydrochloric acid. The following reaction then takes place:—

$$Sb_2S_5 + 6\,HCl \longrightarrow 2SbCl_3 + 3\,H_2S + 2S$$

By determining the quantity of the sulphuretted hydrogen[14] liberated, the quantity of antimony pentasulphide and also the sulphur formed by this reaction, can be calculated.

Thus, when treating a sample of antimony sulphide free from trisulphide with hydrochloric acid, a residue remains, containing, apart from possibly present impurities, the original sulphur present, and the free sulphur separated from the pentasulphide. If this total quantity of sulphur is known, the original quantity of free sulphur can be calculated by taking into account the free sulphur liberated from the pentasulphide.

The following *modus operandus* was followed:—

(*Continued on Page 190*)

9 Compare Gmelin-Kraut Bd. III. (2), p. 720.

10 The antimony sulphide being dissolved in ammonia the red colour disappears, except when antimony trisulphide is present, which dissolves very litle in ammonia. This appeared the case with sample No. 4, containing trisulphide for the main part. Hence the disappearance of the red colour of antimony sulphide on treating with 25 per cent. ammonia can thus serve as a qualitative reaction on the absence of trisulphide.

11 When not all antimony pentasulphide has been dissolved in ammonia, the remainder is decomposed later by treatng with hydrochloric acid, free sulphur being separated. In any case this has to be avoided (compare Table III., note 1).

12 Compare Section 2.

13 The absence of trisulphide can be stated qualitatively directly by treating the antimony sulphide with ammoniacal solution of 25 per cent., whereby the red colour disappears.

14 This can be easily determined by leading the liberated H_2S in an iodine solution of known normality which is afterwards titrated with sodium thiosulphate. This method is preferred above the one mentioned by Stevens, Analyst 40, 275 (1915).

Selling Safety in the Factory

By H. T. Martin

Manager Health and Safety Department, The Fisk Rubber Co.

The greatest results will be attained in accident prevention work in the factory when the safety habit has been *sold* to every employe.

The accident reduction problem is one of salesmanship and must be dealt with accordingly. There are always three things of vital importance in any selling campaign—the article for sale must have merit, the sales force must be organized to the highest point of efficiency and the advertising connected with it must be the very best possible.

The article for sale in this instance is the safety habit and there can be no question about the merit of the goods.

Before we go far into the details of organization we must have a sales manager. The logical man for this job is the factory manager—let's look him over. If he is not qualified for the position it would be better not to fill it at all. He must make good or the whole plan will fail. He must be sincere, have plenty of backbone and pep and be willing to spend some of the company's money to make the plant mechanically safe. Assuming that he has these qualifications, he is made sales manager. This fact should be given considerable publicity. It pays to have every member of the factory organization familiar with the fact that the manager is heart and soul for safety.

The Importance of the Foreman

In looking over the field for a sales force, we find the foremen particularly adapted because of their relationship with the people with whom we are going to do business. The workman judges the company by the foreman with whom he comes in daily contact and will listen to him as to no one else. The foremen, therefore, have long lists of prospective customers. They are intelligent, and when they once realize their responsibilities in connection with this selling campaign, they will sell effectively and are, therefore, engaged. At a series of meetings called by the safety sales manager, these men are instructed about their new duties and advised of methods to be used in order to become efficient safety salesmen, which is essential if they expect to remain on the payroll. They should be put to work immediately in their respective departments.

It is not always possible for the foreman in a large department to get the desired personal contact with the worker, and of course ultimately it is the worker we must reach. In such cases, the work of selling the safety habit must be delegated to an assistant, the foreman becoming an assistant sales manager and his subordinate the salesman. These men should receive preliminary instructions similar to those given to the foremen from the sales manager, and frequent conferences of members of the sales force should be held for the exchange of ideas. There must be no lost force to the selling talk, even though it is transmitted two or three times. Such an organization cannot help being efficient if the boss insists that the men show results. Accident records will soon show where the weak spots are, and they should be strengthened at once even though the extreme measures of removal have to be resorted to. The movement is very contagious. Volunteer salesmen from within the ranks almost invariably join the forces and work with a will. This is highly desirable and should be encouraged in every possible way.

Safety Deparment Publicity

Up to the point of sending the salesmen into the field the safety department has acted in an advisory and statistical capacity only; but when the sales force is organized and on the job, the safety department becomes also the advertising department and assumes responsibility for snappy safety advertising which will be of real assistance to the sales force, keeping the subject alive and reaching not only the foremen but the workmen as well.

The safety advertising manager must be a thoroughly human individual, capable of gaining the confidence of the several classes of men with whom he must mix. He will get cooperation if he knows how, and he must have it to succeed.

The safety department must keep the foremen posted on results they are securing, and give them every possible assistance by studying conditions and making known to them everything which has any bearing on their accident records.

Further work must be done by the safety advertising departments which will reach the worker direct. Safety departments in various concerns as a general thing find it very difficult to put over a new idea. Generally someone else has used and discarded the same thing. The advertising must not be permitted to become stale, changes being made frequently in order that the subject may be of interest.

Methods Used

Some of the methods used to assist the foremen in their selling campaign are described in the following paragraphs:

Many concerns issue periodically pamphlets devoted to safety, giving accounts of recent accidents within the plant, and material of a general nature. However, it has been found that a far more valuable method of driving home the gospel of safety is through the factory house organ. This paper contains many items of interest and is invariably taken home, so that in cases where a certain space is devoted to safety propaganda it is difficult to avoid those articles. The fact that other members of the family are made familiar with this reading matter means that more pressure is brought to bear upon the man we are trying so hard to impress, by someone to whom he may be more willing to listen.

We all appreciate the value of motion pictures in safety work. Many of the larger concerns have prepared films which are interesting as well as instructive and are taken seriously by many who pay no attention to other kinds of safety propaganda. In some cases it is not practicable to make films of this description, but where they can be used, they are always effective.

Safety meetings for the workmen may be held at infrequent intervals to great advantage. However, these meetings are made as short and snappy as possible and are planned to make the men feel that they have an actual part in the whole affair. They are sometimes held away from the plant on the men's time, and in that case arrangements are made to give them as good a time as possible. Safety meetings held at the plant on the company's time can best be confined to subjects interesting the particular department for which the meeting is held.

Simplifying the Rules

Instead of the cumbersome rule book which is often given to the new employe in many concerns, a departmental safety rule book has been published which deals with the operations in a single department only. In that way the individual about to enter upon a new position can easily familiarize himself with the rules pertaining to the operation at which he will work. This subject is important, and gives the foreman the kind of backing he needs in the event that it becomes necessary for him to insist upon a strict adherence to some of the simple rules mapped out for the prevention of accidents which are common in his department. It is advisable always to have the foreman draw up these rules with the assistance of the safety department.

One of the best ways of reaching the man on the job is to designate some definite date as No-Accident Day, to advertise this day in every way possible by special notices, special literature and bulletins, rallies or meetings, by erecting a large score board, tagging every man in the organization with a tag suitably inscribed and to see to it that all of the workers understand the meaning of the tag and the idea. It is advisable in events of this kind to count as an accident only those which result in the loss of time. To do otherwise may prove

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detrimental because the desire on the part of some not to mar the record may keep them away from the hospital for some slight injury, the neglect of which might prove serious. This plan guarantees action and a real, honest-to-goodness drive for safety for the time specified at least, and the after effect is very beneficial. These days may be repeated with variations, such as following with a tagless day after a reasonable interval. After a date has been selected the foreman may be made responsible for the passing of information down the line without the assistance of tags.

A means of direct contact which should not be overlooked can well be carried on by the factory doctor, safety man, man paying compensation insurance and the visiting nurse. These people coming in contact with the man who has received an injury find him in a most receptive mood, and it generally follows that he returns to work a 100 per cent safety salesman. After he has been through the mill, he can well describe to his fellow workers some of the trials and tribulations of a man who is forced to remain away from his work because of injury.

A court of inquiry on all serious accidents conducted by the factory manager has the effect of keeping all foremen and departmental heads on their toes, as no one is anxious to accept the responsibility of a serious injury to his fellow man.

A pretty good slogan for this advertising campaign would be "Tell it to them quick, and tell it to them often." The workman can easily grasp one thing at a time, but in order to make a deep impression on him, an idea must be kept constantly before him.

The entire safety movement is still in its infancy. The efforts for preventing accidents are not confined to industry, but are being carried into every walk of life until everyone realizing the enormous unnecessary loss of life and crippling of men and women, forms habits of safety which will reduce accidents to a minimum, and so we urge every thinking man and woman of America to join the ranks of salesmen who are trying to make this world a safer place in which to live.

Chemical Examination of Antimony Sulphides

(*Continued from Page 188*)

1 gr. antimony sulphide is boiled with 25 c.c. strong hydrochloric acid, sp. gr. 1.18, for about ten minutes, then diluted with water[15] and the insoluble part filtered off on a Gooch filter. The crucible is washed with hydrochloric acid, then with water, and dried at 90 degrees C. The sulphur present is extracted with carbon bisulphide and weighed. This method was carried out with samples Nos. 1-6[16] and the quantity of free sulphur present was calculated according to the above method. The results can be seen in Table IV.

TABLE IV.

INDIRECT DETERMINATION OF THE QUANTITY OF FREE SULPHUR.

No. Sample	Antimony pentasulphide (calculated from liberated H_2S).	Total free sulphur after treating with HCl.	Sulphur separated from antimony pentasulphide (calculated from liberated H_2S).	Free sulphur present in antimony sulphide (calculated).
1	82.6%	15.4%	13.2%	2.2%
2	59.6 "	9.8 "	9.5 "	0.3 "
3	54.0 "	14.8 "	8.6 "	6.2 "
5	38.3 "	42.9 "	6.1 "	36.8 "
6	28.8 "	35.0 "	4.6 "	30.4 "

Table V shows the results of the various free sulphur determinations.

TABLE V.

FREE SULPHUR IN ANTIMONY SULPHIDE.

No. Sample	Extraction with carbon bisulphide [1]	Method with ammonia [2]	Indirect method [3]
1	14.1%	1.9%	2.2%
2	6.1 "	0.6 "	0.3 "
3	10.5 "	3.9 "	6.2 "
5	40.0 "	— [4]	36.8 "
6	32.5 "	28.1 "	30.4 "

[1] These figures are taken from Table I, Section 2.
[2] These are the percentages of free sulphur obtained according to the modified method of Weber, by dissolving the samples in ammonia of the smallest possible concentration, compare Table III., Section 3.
[3] From Table IV. last column.
[4] Not determined.

On comparing these figures the following points attract our attention:—

(1) Extracting with carbon bisulphide yields absolutely erroneous figures, which in most cases are far too high.

That antimony pentasulphide is really decomposed by extracting with carbon bisulphide is also apparent from the observation, that the extracted samples no longer dissolve in strong ammonia (hence formation of trisulphide or other decomposition products), and can moreover be easily confirmed in a quantitative way. After being extracted with carbon bisulphide the samples are treated with hydrochloric acid, the sulphur liberated, again extracted with carbon bisulphide, and from this quantity the percentage of antimony pentasulphide calculated. Table VI shows the figures for the percentage of antimony pentasulphide before and after extracting with carbon bisulphide.

TABLE VI.

ANTIMONY PENTASULPHIDE IN ANTIMONY SULPHIDE BEFORE AND AFTER EXTRACTION WITH CARBON BISULPHIDE

No. Sample.	Before Extraction.	After Extraction.
1	82.6%	8.1%
2	59.6%	24.4%
3	54.0%	
5	38.3%	17.5%
6	28.8%	16.3%

Comparison of these figures confirms that on extracting with carbon bisulphide a very considerable part of the antimony pentasulphide is decomposed, the quantity varying greatly for the different samples. Acetone showed the same result, of which no figures need be published.

Consequently determinations of free sulphur in antimony sulphides by extracting with carbon bisulphide and other solvents yield inaccurate results.

2. It follows further from Table V that by determining the free sulphur according to the ammonia method, the ammonia being of the weakest concentration possible, figures are obtained which agree approximately with those from the indirect method. It is true that samples 3 and 6 show a difference of 2 per cent, but one must take into consideration that the indirect method is also subject to discrepancies. Thereby it should not be lost sight of that an error of 1 to 2 per cent in the percentage of free sulphur is of little importance for the technical aim of this determination, more particularly in view of the great variation in the percentage of free sulphur in trade samples. Hence this method yields useful results, if carried out according to the modifications as stated in Section 3. Moreover, there is the advantage of greater speed.

Conclusions

1. Determining the percentage of free sulphur in antimony sulphide by extraction methods with organic solvents (carbon bisulphide, acetone) is impracticable, as antimony pentasulphide is decomposed by the solvents, free sulphur being liberated (Section 4).

2. A method has been devised for determining free sulphur in an indirect way. This can be used on the condition that little or no trisulphide is present (Section 4).

3. C. O. Weber's method by dissolving antimony pentasulphide in strong ammonia was extensively tested. It was found that this method can only be used when:

(a) Trisulphide is absent.

(b) Dissolving the pentasulphide in ammonia of the smallest possible concentration (Section 3).

4. The methods of Weber-Sweet and Repony for determining moisture and water of crystallization, calcium sulphate and impurities were revised (Section 2).

15 Should the addition of water produce a white precipitate, then add a little more hydrochloric acid.
16 Sample No. 4 was not included as it contained a considerable amount of trisulphide.

The Balata Industry in Brazil

An Account of the Conditions in a New Balata Yielding Territory Compiled from Statements Made by W. A. Boyd, the Pioneer in this District

If reference is made to a large scale map of the northern portion of South America it will be seen that directly west of British Guiana and south and east of Venezuela there is a large block of territory comprising part of the State of Amazonas (Brazil), bounded on the east, north and west by the above countries and roughly rectangular in shape. This territory is watered by the Rio Branco and its tributaries, and is the latest district to be worked for the exploitation of balata. We have recently had the advantage of an interview with W. A. Boyd, a Scotchman, who is known as the pioneer of the balata industry in this vast region, and was previously pioneer for the Consolidated Rubber and Balata Estates, Ltd., in British Guiana. Mr. Boyd it was who first directed the attention of the Government of Brazil to the existence of valuable balata "reefs" on the frontiers of Brazil in the Rio Branco district at the 1913 Rubber Exhibition held at Rio de Janeiro. From information given by him a Government report was compiled and the Brazilian authorities meditated the taking of steps for the further exploration and development of the district. The financial crisis, however, intervened, and the project was allowed to drop.

The Expedition and Its Backers

In 1917, however, Mr. Boyd succeeded in interesting a London group, intimately connected with the balata trade, in the Rio Branco district, and on October 1st of that year he and Dr. Norzagaray sailed from Liverpool for Manaos, and proceeded thence up the Rio Branco. Before going on to Mr. Boyd's account of the conditions in the new balata regions, which this expedition was instrumental in opening up, a few words will not be out of place as to the nature of his financial backing, and the importance of locating and developing new fields for the exploitation of balata. The enterprising people behind Mr. Boyd and his partner, Dr. Norzagaray, were Messrs. G. A. Petts and F. Wallin, directors of Balata, Ltd., Crutched Friars, E.C. Between Balata, Ltd., and Messrs. Hepburn, Gale and Ross, Ltd. the well-known balata manufacturers, of Grange Mills, Bermondsey, and Mitcham, there exists a close community of interests. The same interests control the Real Daylight Balata Company, Ltd., of British Guiana, and other undertakings, while the Rio Branco Development Company, Ltd., recently formed to carry on the development in the Rio Branco region, for which Mr. Boyd did the spade work, is, of course, amongst their latest enterprises. Besides controlling these various exploitations, the group are, of course, very largely interested as buyers and re-sellers of balata, either by contract or in the open market.

The reason why the balata trade is vitally interested in the discovery and development of new producing areas is not far to seek. We have in the case of balata a steadily increasing demand with no possibility, except through the development of new areas, of a corresponding increase in supply. The market value per pound is now more than double that of rubber. Much damage has been done in the past through the wanton destruction of trees, and balata is not looked upon as a planting proposition, though experiments in this direction are, we believe, being made in the Congo, and also in the Dutch East Indies. We have no accurate information as to the length of time which the tree requires to grow to maturity, but it is to be feared that it is too long to give much encouragement to the investor. Mr. Boyd, we may say incidentally, believes in the existence of scattered "reefs" of true balata throughout the whole area of Brazil north of the Equator.

Two Bad Seasons

The expedition up to the Rio Branco had the worst rainy season and the worst drought for many years to contend with during 1918 and 1919 seasons. Owing to the difficulty in procuring expert bleeders, coupled with attacks of the "grippe" (Spanish influenza), which played havoc amongst the employes, only forty-seven tons of balata were shipped during these first two seasons. Small though this output was compared with expectations, it was far greater than any quantity which had been previously exported from the region and justifies Mr. Boyd in claiming that his outfit was the first to ship balata on a commercial scale. The first actual shipment of balata of any size which is recorded was sent out of the territory by Lt. Pinto Peixoto in the year 1900, and amounted to only one ton. Between that year and 1918 the total shipments did not amount to more than fifteen tons and for five years at a time there were no shipments at all. Messrs. Norzagaray and Boyd's headquarters were located at Vista Alegre, but the Rio Branco Development Company intend operating from opposite Carapanatuba, where the Savannah grass is of better quality. About sixty bleeders are being employed for the 1920 season.

Conditions of Obtaining Grants

The matter of procuring the right to work selected balata "reefs" which presents some difficulties in the Guianas occasions no trouble in Brazil. One has only, Mr. Boyd told us, to explore a small or large area, cut a boundary or estrada (path) round it, occupy and work same, provided it does not overlap any areas belonging to owners by purchase or seringueiros, squatters, etc. The trading store licenses and duties on produce exported are very small. A "stranger" must, however, have a license to explore for produce and for mining (which is very hard to secure); a black or colored bleeder, miner or laborer can overcome this difficulty by working with a Brazilian employer or in partnership as a "blind." This is very similar to what is called the "pork-knocking," system in the three Guianas. The men work without any supervision whatever, go where they like over immense areas, and bleed trees to death without being held responsible.

Reef Location and the Construction of "Dabreys"

Asked what is the length of the bleeding season in the district of Amazonas which he had prospected for balata "reefs," Mr. Boyd said that it corresponded with the wet season and was roughly from June to September. The dry season was a time for prospecting and locating the balata "reefs." Suitable "reefs" having been located, the foreman of the balata prospecting expedition would then pick its headquarters and drying ground, make a big clearing, and erect huts and dabreys. The first business in the construction of a dabrey is to make the foundation and sides of logs solidly pegged to the ground. Above this come crosspieces and a firm platform of slats made from what material the forest affords. On top of this again comes a thick coating of clay firmly pressed down. There is thus obtained a shallow, oblong pan of large dimensions. The hard clay foundation is then smeared well with soapsuds, after which a quantity of balata milk is poured into the pan and allowed to form a "bottom scab." The first scab is left at the bottom of the pan until the end of the season and it, of course, protects subsequent fillings of balata milk from coming in contact with the clay bottom. When finally stripped off it is generally sold as second grade balata.

The other portion of the dabrey is the shade, consisting of a framework of poles covered with a heavy thatch of palm leaves. This moves on roughly contrived hinges at the bottom; at the top it is manipulated by means of a long pole enabling it to be brought forward to protect the pan or trough during rain. Exposure to the effect of heat and sun in these shallow pans, protected as above stated, is the only treatment given

"India Rubber Journal," London, England.

in the ordinary way to the balata milk. Expert black breeders prefer to build large size dabreys, while Peruvians and Brazilians use dabreys of medium size. When removed from the pan the sheets are allowed to drip into it. They are then removed and suspended for final hardening off, strips of bark being fastened along the ridge to prevent the balata sheet from cutting along the line of suspension. Lime juice or a little vinegar is sometimes added to the milk in the pan for the purpose of obtaining a fine amber color in the balata. Blue balata can similarly be obtained by adding a very little petrol.

Method of Bleeding

Questioned on the methods of bleeding trees, Mr. Boyd said that a rough herring-bone pattern of incisions, is practically universal. Incisions are made with an "alligator brand" cutlass, 18 inches or 20 inches long. Incidentally it may be mentioned that all measurements made in the course of balata expeditions are usually in cutlass lengths. Thus the usual size of a dabrey as described above is either 4 by 6 or 6 by 8 (the figures in each case denoting cutlass lengths of 18 to 20 inches.) Of the three methods of ascending the trees, viz., the ladder, the "vention" (or rope), the spur systems, the last named is now in general adoption. The spurs are fixed to the feet and below the knees. Round the man's middle is an adjustable belt carrying three iron rings. A length of wire rope is passed through these rings round the tree in one or two passes, brought back and locked in a plate with four holes which hangs on an "S" at its other end, and the climber then works his way up the tree by means of the spurs, supporting himself with the belt. Expert bleeders are quite at ease in this rig, and having ascended to the required height they will slip down the belt and sit easily in it while slashing right and left. The spurs occasion the need of strong footwear, which native bleeders would not otherwise count among their essentials. The knees must also be padded, which Peruvian and Brazilian bleeders do with sacking, etc., but the British West Indian bleeder, the aristocrat amongst working men in the balata districts, insists upon boots which come right up to the knee.

Collection of the Balata "Milk"

The milk is collected in small canvas bags which narrow at the mouth and are proofed on the inside by means of a coating of balata. These are placed at the bottom of the tree at the foot of the bleeding cuts, being attached thereto by a nail or splinter of wood and propped open with another splinter. From the small collecting bags the milk is transferred to larger bags, which the bleeders carry on their backs. These larger bags are in turn emptied (preferably through strainers of metal gauze) into still larger receptacles, also of canvas proofed with balata, which the bleeders keep in their huts. From these largest bags (called "coolers") it is eventually emptied into the dabreys, which have been previously described.

Importance of Brazilian Balata Reefs

"Is it likely, in your opinion, Mr. Boyd, that the districts round the northern frontiers of Brazil will ever attain a position as balata producers comparable with that now held, for instance, by British Guiana?"

"I should hardly think so, and yet would harly like to deny the possibility absolutely. It must be remembered that there are large areas of open Savannah country, and also other large areas which appear to contain nothing but brittle balata. Then there are many good 'reefs' which have been ruined for many years to come through reckless bleeding. The whole of the district south of the Guianas on the Brazil side, or in the Cunani Buffer State, as some would say, is no doubt extremely rich in balata, but there the difficulty is transport, and this difficulty is at present so great as to be insurmountable. In the Rio Branco district we have fine navigable rivers and better transport than you can get elsewhere, so much so, in fact, that British black bleeders have been absolutely spoilt by their experience in this region, and will be unwilling to undergo in future the hardships incidental to balata seeking expeditions in the colonies further north. There is one river, however, the Mucadjie, down which there floats large quantities of the plant used by the native Indians to poison their arrows. The water is thus rendered undrinkable and the navigation highly dangerous. Happily, however, there is ingress to the rich balata 'reefs' on this river by means of an igarape or creek, which connects it some distance up with the Rio Araraquara further north."

Reckless Bleeding of Balata Trees

"You referred just now, Mr. Boyd, to the reckless bleeding of balata trees. How is it that if there has been so much reckless bleeding—enough to have ruined whole areas—we have seen so little result of it in the way of balata exported? Though all careless bleeding is to be deprecated one would at least expect it to result in big quantities going forward for a short time."

"What I was referring to was bleeding toward the commencement of the dry season, when the yield obtained is not commensurate with the damage done to the tree, also the reckless use of spurs, making deep holes through which insects have entered and attacked the trees, and finally bleeding in the flowering and fruiting seasons, when the milk is in the top of the trees and in the fruit."

"When is the fruiting season to which you refer?"

"This is just what we do not know; all the inquiries I was able to make have not enabled me to find out what the periodicity is. A tree will flower one year—1919 was a flowering season—and perhaps not again for many seasons. Trees bled during the period of flowering yield hardly any fruit, and this drops off before it is properly ripe, and a valuable quantity of milk in the trees is lost. There are many of these botanical puzzles to which the clue is yet to be found. It is a curious fact, for instance, that we never find true balata among Castahnals (Brazil nut tree reefs)."

Characteristic Foliage

"How is the true bullet tree (Mimusops globosa) to be distinguished from the trees yielding brittle balata?"

"The underside of the leaves in Mimusops globosa is of an orange color—a sufficient indication when they can be seen. Reefs of true bullet trees as viewed in the distance from rising ground are quite unmistakable, owing to this peculiarity. The trees yielding brittle balata are:—

Mimusops Caimito (D.C.).
Mimusops Elatalis (F. All).
Mimusops Fissilis Cont.)—guaraqua.
Mimusops Gigantea (Cont.)
Mimusops Lastiocarpa (Cont.)—abiurana.
Mimusops Laurifolia (Cont.)—guapeba Vermelha.
Mimusops Procera (Cont.)—masseranduba branca.
Mimusops Amazonica (Hub.).
Mimusops Maparajuba (Hub.).

The Labor Supply

The classes from which balata prospecting expeditions mostly draw their labor supply are the Brazilian and Peruvian seringueiros (rubber collectors) and "Barbadians" (a general description covering British black laborers, whether they hail from British Guiana, Trinidad, St. Lucia, or elsewhere). The cities of Manaos and Para are full of these last, and they are cordially detested by the Brazilian population. Well-dressed and civil spoken as they show themselves in the cities, they prove a thorn in the side of the parties engaging them, proving themselves, in the majority of cases, to be undisciplined and vindictive scoundrels. Many of them are men who took large advances from various British companies in British Guiana and decamped when sent up to work in the "Guayana do Melville" district; hence perpetual warrants are out against them, and they dare not leave Brazil.

With all this against them the British black bleeders are nevertheless, in Mr. Boyd's opinion, the most expert and efficient bleeders.

The Brazilian labor available is, generally speaking, the scum of the country drifted from other parts of Brazil, and is very lazy and unreliable. Brazilians do not take kindly to bleeding bullet trees, they call it "monkey work" and only fit for black men. The few that have the strong stamina,

* In the old days calabashes and 5 gal. kerosene tins were used. If left too long in these tins the milk turns black; vinegar or lime juice, as noted above, is then used as a corrective to regain something approaching the amber color.

Bleeders are paid so much per kilo (2½ lb.) of dry balata taken over by the Company's authorized representative, and the advances made in Manaos, Vista Alegre, etc., are then deducted, similar to the system in the three Guianas.

leg and arm muscles to bleed, get tired after a few weeks during the few available months, take a holiday, and return when the spirit moves them, in spite of their keen desire to cut a figure with plenty of "dinheiro" (money). The black bleeders, on the other hand, eat and live well and have the stamina and determination to bleed for the whole season. Peruvians very easily and quickly seem to learn the art of climbing and bleeding the trees, but they have not the stamina to work as long as the black men. The few conscientious Peruvian and Brazilian foremen or patrons who have learnt the art and knack of climbing balata trees with spurs, heavy belts and steel ropes, and using a cutlass, prefer to secure Peruvians who have never been in Manaos and been contaminated by association with British black men and the Brazilian laboring classes, whose one aim seems to be to bleed employers as much as possible and to do as little work as possible. These men with their families are inured to hardships; their requirements and advances are small, and a settlement of accounts is made every two or three years.

The System of Advances

It is the custom among the Brazilian and Peruvian, etc., employers to advance seringueiros and to keep them always in debt to them, charging enormous profits on the foodstuffs, clothing, drink, medicines and necessities supplied; therefore, as these seringueiros generally have a wife and a large family to support they cannot transfer or run away easily to another employer, but have to exist the best way they can, augmenting their poor payment now received from rubber, by shooting, planting and fishing. Should these seringueiros transfer owing a debt, their new employer is worried to guarantee payment to their previous employer, if not, the seringueiro is worried severely until the debt is settled. It is, therefore, no wonder, as Mr. Boyd pointed out, that these seringueiros and their families look so unhealthy and anaemic.

Messrs. Norzaray and Boyd's laborers were heavily advanced at Manaos, and on arrival at headquarters they had to be advanced again with apparatus. clothes, etc., and food during the bleeding season. As the district was unknown, stores were delivered by the company to the drying grounds by animals or carriers, and balata brought down from the camps to the waterside at the company's expense to encourage bleeders to come to the district; once they become plentiful it is hoped to introduce the system in vogue in the three Guianas, viz., not to advance the men in Manaos but on arrival at up-river headquarters, the bleeders to transport the goods themselves to their drying grounds and to deliver the balata at headquarters.

Indian Bleeders

Among the bleeders who brought balata to Messrs. Norzagaray and Boyd's headquarters were the members of a tribe of Indians (Yaricunas) living over the Venezuelan frontier to the north. These Indians, according to Mr. Boyd, are far from expert at the work; very few indeed have learnt the spur system of bleeding trees, the rest using ladders of short length. They live to the west and south-west of Mr. Roaraima, and have a comparatively enlightened chief, whose influence, however, is not enough to interest them to take up the regular exploitation of their forest resources. Macusey Indians reside on the Brazilian frontier.

About seven years ago, owing to the careless firing of dry grass during the dry season to enable new grass to grow up later, a long reef of rich bullet trees on the Brazil side of the distinctive high range of mountains separating Brazil and Venezuela between heads of Rios Cotingo and Surumu, near Tuchana Antonie's (Indian headman) quarters, was burnt out, leaving the Venezuelan portion untouched.

The bark of the true bullet trees on this Venezuelan frontier, Mr. Boyd observed, is extremely hard compared with the trees further south, and the average quantity of milk from a tree in Rio Branco district is much greater.

We have seen what is Mr. Boyd's opinion of the class of labor available. He is even less enthusiastic—if that be possible—regarding the type of Brazilian official which is encountered in the up-river districts. Politics he regards as the bane of the country, and the leader of an expedition is exposed to all kinds of petty intrigue carried on behind his back, and often involving him in difficulties with the local authorties. Among the lesser plagues in the Rio Branco district are the pioes (small black sandflies which bite viciously from daybreak to dusk); after dusk the mosquitoes pay their attentions, especially during the rainy or bleeding season. In other localities in daytime one has an addition—the huge horse or mangrove flies of various qualities that pester men and animals and leave a maggot in the skin after a bite, and at night numerous vampire sucking bats (small species). In the dry season a nice, cool breeze is blowing most of the day, and at night the plagues are almost nil.

With all these drawbacks, Mr. Boyd is going back; cities do not appeal to him. He has had a long and varied experience in the various tropical parts of the world, and is still very active. We understand that he specializes in doing the initial prospecting and spade work for large exploitations, afterwards handing over the enterprizes to capitalists to develop in their own way.

Other Expeditions and Locations of Balata

Among other expeditions in search of balata-yielding areas which have been more or less successful, or have resulted in failure, Mr. Boyd mentioned that of Jules Arana. This well-known Peruvian rubber magnate sent up a small expedition in 1919 and located "reefs" at the head of the Rio Yaupery, working up toward the Rio Annaua, the southern boundary of the area prospected by Messrs. Noragary and Boyd. He has now, however, given up working this district and is paying attention to the head of the Rio Nappi, a tributary of the Upper Amazon toward Peru. Owing to the transport expenses Zany and Carolino are not now working their balata reefs at the head of the Rio Takutu. For the same reason it does not pay to work the Venezuelan balata.

A British black bleeder named Archer bled balata at the head of the Rio Trombetos, but as he had difficulty in getting financed and troubles in securing reasonable payment in Para for his porduce he gave it up, enlisted for the war and is now a sailor on a steamer visting Para. A group of Colombians with Indians are bleeding balata at the Rio Caqueta toward Colombia. At the head of the Rio Negro, balata reefs have been located, but here again, owing to present transport difficulties, it does not pay to work them.

Imports of Rubber Tires into South Africa

Commerce Report No. 239, issued by the Board of Foreign and Domestic Commerce, Washington, D. C., under date of October 11, 1920, contains the following with respect to the importation of tires and tubes into South Africa:

The value of all rubber tires, including inner tubes, imported into the Union of South Africa during the year 1918 and 1919, was as follows:—

From—	1918	1919
United Kingdom	$1,090,066	$963,903
Canada	$ 44,875	242,288
France	76,983	400,703
Italy	50,822	78,313
Japan	10,873	3,319
United States	548,562	714,719
Total	1,822,181	2,403,245

The customs duty on rubber tires imported into South Africa is twenty per cent ad valorem. A rebate of three per cent is granted on the products or manufactures of the United Kingdom and reciprocating British colonies.

At the close of the year 1919 there were approximately 9,000 motor cars of all descriptions registered in the Cape Province. Most of these consisted of pleasure cars. There were also registred at that time 4,117 motor cycles.

Most of the motor cars in use here are of American make, consisting of the lighter and medium-priced cars. Most of the British cars used here are also of the lighter and cheaper models. Roads in the rural districts are very poor and the cars used are essentially employed for traveling in the cities and short runs nearer the larger centers, and are of a type particularly suited for this purpose. Few trucks or heavy touring cars are used.

TRADE NEWS REVIEW

News -- Personals -- Building Activities -- New Products -- Financial

Tire Supply Over-Estimated

In view of the fact that the tire industry has experienced a decline in sales in common with other automotive products, and all manner of rumors regarding overproduction have been current, Col. Samuel P. Colt, chairman of the board of directors of the United States Rubber Company, and W. O. Rutherford, vice-president of the B. F. Goodrich Company have made the statement for publication in New York that if every car owner in the country were to buy one extra tire, the present surplus would be exhausted in one day.

Col. Colt said: "While the tire trade is in a demoralized condition at present owing to the change in times which has resulted in overproduction, I feel that the business cannot fail to right itself within from four to six months.

"The approximate value of tires sold in the United States in 1914 was $300,000,000, while the value in 1919, five years later, was $1,000,000,000. It was estimated before the change in times that in 1920 it might reach $1.200,000,000. This increase, however, will not be realized, but at the same time I believe the value of tires sold in 1920 will fully equal the value of those sold in 1919, and I shall be surprised if 1921 does not show a value exceeding that of any previous year.

"It is, however, so to speak, the last bushel of wheat that fixes the price, and with the slackening of the purchasing power prices have been somewhat demoralized, but with the curtailment of the leading manufacturers I think this condition will not long exist. Say that the business increased $700,000,000 from 1914 to 1919, I would predict that the increase will exceed $700,000,000 in the next five years."

Mr. Rutherford said: "Motor cars and trucks are essential to the welfare of the country, and without them transportation facilities and business generally might easily be paralyzed.

"The motor vehicle must be used in this country constantly, so it is not a serious matter if we have a few extra tires on hand above the ordinary supply. The tire is the steel rail of the motor car, and is just as essential as rails are to railroad traffic. The supply of these tires on hand is no greater, and indeed, not so great as the supply of shoes, clothing and other materials in other industries.

"There are let us assume, 7,500,000 motor cars and trucks in use in this country. Each vehicle requires four tires in service and at least one spare. In other words, there are 37,500,000 tires in actual use now.

"There are in this country now in the hands of merchants and manufacturers of tires about 10,000,000 tires, according to one estimate of a reliable journal.

"I should say that the tire industry was in a fairly normal situation. Our first step when it appeared that there would be a slackening of the demand was to curtail production. This was in keeping with the spirit of the times, and we responded readily. That early response has discounted any possible serious situation which might have arisen. It is now possible to effect the readjustment which is going on in all our industries in an orderly and simple manner."

The Canadian Rubber Industry

Canada in 1919 had thirty-two factories producing rubber goods and rubber boots and shoes, according to a recent statement issued by the Dominion Bureau of Statistics. Ontario is the center of the industry having eighteen plants producing rubber goods and five turning out rubber boots and shoes. Quebec has three producing rubber goods and five rubber boots and shoes; while British Columbia has one plant turning out rubber goods.

The total capital invested is $42,787,594 of this $33,005,888 is found in Ontario; $9,763,333 in Quebec and $18,373 in British Columbia. Two-thirds of this investment is in plants etc. producing rubber goods. In this department Ontario greatly predominates with an investment of $27,706,575 out of a total of $33,005,888. On the other hand, in Quebec $8,903,566 out of $9,763,333 is found in the rubber boots and shoes department.

The number of persons employed is given as 12,667 of whom 9,334 are males and 3,343 females. Those employed in rubber goods plants number 6,835; in rubber boots and shoes plants 5,842. The wages and salaries paid during the year total $11,547,817; $7,004,028 to rubber goods employes and $4,543,789 to those in rubber boot and shoe plants.

The cost at the works of the material used during the year is returned as $19,671,453 for the rubber goods factories and $7,862,961 for those turning out ruber boots and shoes. The value at the works of rubber goods produced during the year is given as $36,651,640 and of rubber boots and shoe products as $19,351,794.

The exports of rubber products have increased very greatly during the last five years. In the fiscal year 1914-15 they were valued at $722,905; 1915-16 at $3,081,874; 1916-17 at $2,666,506; 1917-18 at $2,911,505; 1918-19 at $5,629,590; 1919-20 at $10,069,963. In the last mentioned year $7,291,777 of the total value represented pneumatic tires of which $3,547,601 went to the United Kingdom.

Tire Standardization Postponed

That the present is not the time to put the proposed tire standards into effect and that the matter be referred back to the committee was the decision arrived at by those in attendance at the joint conference of affected interests which was held in Cleveland under the auspices of the Society of Automotive Engineers, on November 22nd. The conference was attended by representatives of the car, truck, tire and rim manufacturers, the Rubber Association of America, the S. A. E., and the National Automobile Chamber of Commerce.

The subject in question was discussed from every angle with the result that it was decided to continue the present standard and to refer suggestions relating to the subject to a committee representing all the affected interests, which should make a study of the question in the light of future developments. Resolutions were also passsed which approved the continuing of the existing standard of pneumatic tires and opposing for the present the standard based on a 24-inch wheel.

Many members of the tire industry who were in attendance and approved the proposed standard contended that such a move would make for economy in production which in turn would result in reduced prices and additional advantages to car owners.

Car manufacturers and members of the National Automobile Chamber of Commerce were also in favor of further standardization but argued against its adoption at the present time. In supporting their contention they pointed out that the tendency in automobile design was in the direction of wheel diameter smaller than the 24-inch size; the large production using and planned for 25-inch wheels; the increased expense in some instances to the car manufacturer for tire equipment; disturbance of the export situation, etc. Emphasis was laid upon the fact that the present standard had been in operation only since January 1, 1920 and that from now on there would be a general and increasing discontinuance of the sizes eliminated at that time which would in the future permit tire manufacturers to reduce by one-third the number of sizes made.

Dutch Planters to Cut Production

The Rubber Growers' Association announces that an intimation has been received from the International Association for Rubber Cultivation in the Netherlands Indies that over seventy per cent of the producing area owned by members of that association have agreed to the proposals for a twenty-five per cent reduction of output.

News from the Industry at Large

New Company on the Coast—Bergougnan Completes Construction—Work on Wildman Plant Begun—Washington Rubber Factory Sold—Goodwear Tire to Build

New Company on the Coast

The California Rubber Company is the name of a new organization which has recently opened offices in San Francisco, Cal. It is incorporated under the laws of California by men experienced in the rubber business and familiar with the Pacific Coast markets and trade conditions. The company has established its main office in the Oceanic building, San Francisco, and anounces that it will erect a factory in the metropolitan district. Several sites, on both sides of the bay, are being considered and plans and specifications for the first unit have been accepted.

The company will engage in the manufacture of a high grade cord tire, in all standard sizes, made from the best gum rubber and best cord from long staple cotton. Other products of the company will be inner tubes, made to conform to the tire, dipped rubber goods, mechanical rubber goods and rubber tubing and hosing. It also intends to erect a reclaiming plant.

An announcement of the company continues:

"R. L. Brown, well known business man of Akron, Ohio, is president and general manager. He has been connected with the rubber industry for a number of years. John R. Jones, secretary of the company, is a well known San Francisco attorney. Henry P. Adams, for many years connected with the San Francisco Chamber of Commerce, is treasurer of the new company and executive assistant to the president."

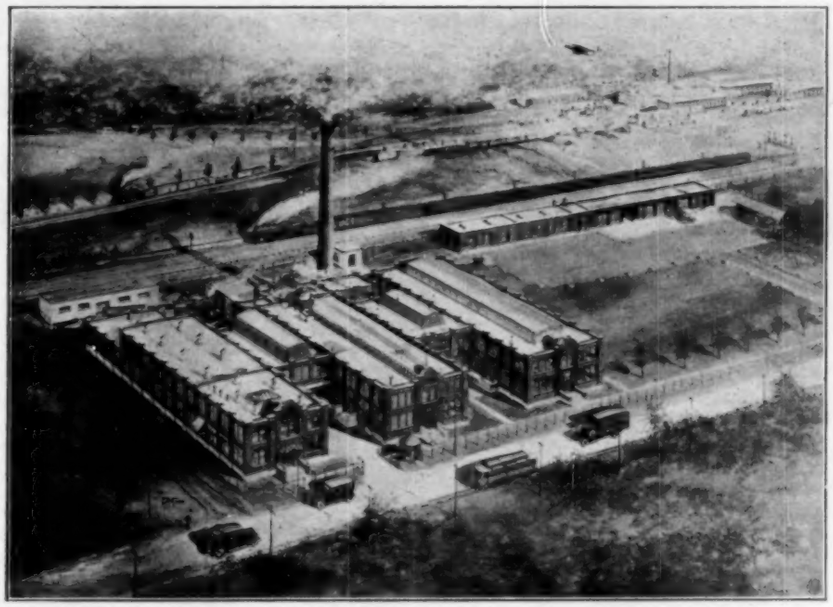
Bergougnan Completes Construction

That the stage is being set for good and substantial business in 1921 is forcibly brought home to the people of Trenton by the activities of the Bergougnan Rubber Corporation—which has completed the construction of new and extensive additions to its model plant on the Hutchinson Mill Road, and is now proceeding with the installation of the latest types of perfected machinery, to the extent that the capacity for tire and tube manufacturing will be more than doubled at the Bergougnan plant.

A little more than a year and a half ago, the Bergounan interests acquired what was already one of the most modern and best equipped of Trenton tire manufacturing plants, and immediately set to work to turn out a product and to develop an organization, which so rapidly produced business in a volume that the plant was crowded to the limit of its capacity.

The construction work has just been completed at the Bergounan plant, as well as the improvements in the older buildings and the new machinery, now in process of installation, will give the Bergougnan facilities that will make it one of the largest of Trenton's tire manufacturing concerns. Pneumatic tires for passenger cars, motorcycles and motor trucks, as well as inner tubes for the same, will be produced under the most approved of modern working conditions.

In addition to the foregoing, the company has made many improvements for the benefit of the working force. Among these is the installation of an up-to-date cafeteria where warm, substantial meals are served to employes at cost.



PLANT OF BERGOUGNAN RUBBER CORPORATION, TRENTON, N. J.

Work on Wildman Plant Begun

Word has been received that the Wildman Rubber Company is pushing the work on their new tire factory at Bay City, Mich.

The work of excavation for a building 386 by 187 feet has been completed and contract is let for the foundation and basement, which are to be entirely of reinforced concrete. The plan is to have this work completed in time to permit the erection of the steel work to start as soon as weather conditions will permit.

The first unit of Wildman Rubber Company's new plant at Bay City will have a capacity of 2500 tires and 5000 tubes per day. The company has an authorized capitalization of $10,000,000 of seven per cent cumulative preferred stock participating with the common stock up to ten per cent and 100,000 shares of common stock, no par value.

Washington Rubber Factory Sold

Subject to ratification by the stock holders of the Washington Rubber Company, the plant of that company located at Washington, Pa., has been sold to the Gearless Motor Corporation of Pittsburg, Pa.

At a recent meeting of the directors of the rubber company, by unanimous vote, authority was given the president Albert Zeit, to make sale of the site and building to the motor corporation. Several other industrial concerns were seeking to purchase the plant and from among these the directors chose to make the transfer to the Pittsburg firm.

Goodwear Tire to Build

The Goodwear Tire & Belt Factory, San Antonio, Texas, is beginning the erection of the first unit of its new plant. The firm owns twenty-five acres of land, five miles south of San Antonio and it is there that the new plant will be built. The firm will at first make dipped goods and a few mechanicals and will later expand and manufacture tubes and possibly tires. R. A. Gable of Akron, Ohio, has been engaged as superintendent of the plant.

Seeks Representation in Japan

Word has been received from the Far Eastern Trading Co., of Tokio, Japan, to the effect that this firm is desirous of getting in touch with some tire manufacturer in the United States with a view to handling its product in the island empire.

The firm in question was established recently in Tokio and Osaka with a capital of 100,000 yen and handles a complete line of mechanical and surgical rubber goods. Any American tire company interested in this notice may communicate with the above company care of The Okura, Yoshiten, Ltd., Tokio, Japan.

News from the Rubber Metropolis

Firestone Reduces Salaries—Goodyear New Financing—France Honors Seiberling—India Appoints New Distributor—Victor Rubber Announces Earnings—Akron Stock Prices—B. & W. Elects Officers

Firestone Reduces Salaries

A reduction in salaries paid to office employes at the Firestone Tire & Rubber Co., Akron, Ohio, was announced on November 30 as follows:

"In announcing a ten per cent reduction in the pay of its salaried employes, the Firestone Tire and Rubber Co. gave full and careful consideration to every phase of the present economic situation. Conditions have necessitated a retrenchment in every line of production. Salaries came last, but could not be excepted.

"It is only fair in making this announcement that attention should be called to the fact that at the same time the company also reduced the returns on the money invested in the business—in other words, the dividend rate—from $2.00 to $1.50 per share per quarter, which means that the income of capital was reduced twenty-five per cent.

"Wages paid to direct labor in the factory have not been reduced, but the hours have been cut as a means of meeting the situation. This has enabled the company to give employment to as many men as posible.

"The operation of the law of economics cannot be avoided by artificial support of the pay envelope. The same conditions that have caused this salary reduction are also operating to reduce the cost of living. Commodity prices have come down somewhat already and there is every indication that they will continue to decrease for an indefinite period.

"During the past twelve months the Firestone company increased salaries twenty per cent. It met the increased cost of living to its employes last January with a raise of ten per cent and added another ten per cent last April when the peak of high prices was reached. It has now asked its salaried employes to accept a reduction commensurate with the demands of good business principles and the present economic conditions. They have co-operated with true appreciation of the situation."

Goodyear New Financing

(Special Akron Correspondence)

Directors of the Goodyear Tire & Rubber Co. are now negotiating for new financing which is expected to put the Company on a firm financial basis and enable it to go ahead with business plans for next year. The negotiations, however, have not gone far enough to enable a final report to stockholders and the meeting scheduled for Dec. 6 will be adjourned until a later date, it is said.

The following announcement has been made by Vice-President G. M. Stadelman:

"Some time ago the Goodyear Tire & Rubber Co., made an arrangement with a group of banking interests for a temporary loan of $25,000,000 to help carry its inventory, which while high based on present business, would have been normal under usual conditions. The loan will be payable February 15, 1921. It was made to enable the company and bankers to work out permanent financing plans in the interim.

"Our annual meeting is scheduled for Dec. 6, but will be adjourned and a special meeting held shortly thereafter at which time the permanent financing plan will have been completed and will then be announced."

France Honors Seiberling

The French government recently sent five medals to the Chamber of Commerce of this city for presentation to five of Akron's foremost business men in appreciation of treatment accorded the Foreign Economic Commission of French businessmen who visited the city several months ago.

One of the recipients was F. A. Seiberling, president of Goodyear Tire and Rubber Co., who escorted the commission through the factories, by which the foreign visitors were greatly impressed.

India Appoints New Distributor

The India Tire & Rubber Company, Akron, Ohio, recently announced the addition of F. W. Abbott to the list of the Company's distributors. F. W. Abbott who will handle the Minneapolis, Minn., territory, has been connected with the rubber industry in a sales capacity for many years. His ability has enabled him to build up an extraordinarily large business in his district. Abbott's contract with India will cover a period of years, and involves a large amount of business, considering the size of the territory.

Victor Rubber Announces Earnings

(Special Akron Correspondence)

The Victor Rubber Co. has deferred its common dividend, but announces that earnings for the nine months ended September 30 were $105,624. The mechanical department of the company is working full time, but tire production is down one-third. Officers, however, are planning for a reopening of the tire market.

Following is the statement of the company:

ASSETS.

Cash	$ 25,268
Bills receivable	22,258
Accounts receivable less allowance for bad debts	538,437
Inventories	.....
Other assets	7,371
Deferred charges	39,351
Permanent less allowance for depreciation	688,777
Patents	1,179
Total	$2,290,668

LIABILITIES.

Bills payable	$ 372,249
Accounts payable	320,681
Accrued accounts	4,389
Reserves, including reserve for plant depreciation	108,433
Preferred stock	300,000
Common, no par	1,117,082
Surplus	67,834
Total	$2,290,668

Akron Stock Prices

(Special Akron Correspondence)

The recent reduction in the dividend rate on Firestone common from 8 to 6 per cent has served to bring offerings of these shares on the Akron rubber stock market at a new low level of 85. Even at this figure there is little demand for the stock, but that is true of most all local issues no matter what the price may be. The investor in rubber shares, evidently, is becoming more and more reluctant to enter the market at this time.

Firestone 7 per cent preferred has dropped below 80 while 6 per cent preferred of the same company holds firm just under 90.

Goodyear sales, both common and preferred, continue to feature an otherwise inactive market. Goodyear common is holding around 44, while preferred is off a triffle to 67.

Miller common is down to 95 asked and no offers are made. The bid price for Mohawk now is 99. Portage common is down to 38.

Following are the quotations of December 1:

	Bid	Asked
Amer. R. & T. com	...	70
Amazon Rubber	...	50
Firestone T. & R. com	...	85
do 6 pct. pfd.	87	89
do 7 pct. pfd.	78¼	80
General T. & R. com	...	500
do 7 pct. pfd.	...	90
B. F. Goodrich com	42	43½
do 7 pct. pfd.	77	79
do 5 yr. 7pct. pfd.	88¾	89¼
Goodyear T. & R. com	43	44
do 7 pct. pfd.	67	68
India Rubber com	...	130
do 8 pct. pfd.	...	80
Mason T. & R. com	15	17
do 7pct. pfd.	56	60
Marathon T. & R. com	...	4
Miller Rubber com	...	95
do 8 pct. pfd.	85	87
Mohawk Rubber	99	110
Portage Rubber com	...	38
do 7 pct. pfd.	56	60
Republic Rubber com	1¼	1¾
do 7 pct. pfd.	...	40
do 8 pct. pfd.	20½	22
Rubber Products	...	100
Star Rubber com	...	110
do 8 pct. pfd.	...	100
Swinehart T. & R. com	...	40
do 7 pct. pfd.	...	70
Phoenix Rub. com	...	20
do pfd.	...	90
Standard Tire com	...	125
do pfd.	...	90

B. & W. Elects Officers

(Special Akron Correspondence)

H. A. Backderf has been elected president of the B. & W. Rubber Co. for the ensuing year. Other officers are: D. B. Campbell, vice-president; Eric Richards, treasurer; and Mary E. McGowan, secretary and assistant-treasurer. The directors are: H. A. Blackderf, Charles K. Strobel, D. B. Campbell, Eric Richards and Martin Garvey. The company plans to begin operation of a factory in North Akron within three months making rubber heels and general mechanical goods.

Perfection Tube Plant Burns

Officials of the Middle States Rubber Co., Cleveland, said that damage estimated at $50,000 resulted when their Perfection Tube Co. plant at Painesville, Ohio, was destroyed recently.

The plant has not been in operation for a month.

Goodyear Adjourns Meeting

The annual meeting of the Goodyear was called to order at 10 o'clock December 6 at Goodyear hall, but was adjourned until the afternoon of December 23 at 2 o'clock. About 300 stockholders were in attendance when Attorney W. E. Young selected as permanent chairman of the meeting, called the session to order.

F. A. Seiberling, president of the company, told the stockholders that the annual audit would be completed by December 23, and submitted to the stockholders at that time. The work is being done now, Mr. Seiberling said.

The permanent financing plan of Goodyear will also be placed before the stockholders for their approval at the adjourned meeting, President Seiberling stated.

Mr. Seiberling, with other officials of the company, has been in New York the past week preparing a new financial plan with eastern bankers. It is believed a solution to the problem was secured.

A vote of confidince in the Goodyear board of directors and President Seiberling was unanimously passed.

L. C. Rockhill, sales manager of the Goodyear Tire & Rubber Co., has been nominated to succeed J. P. Loomis as a member of the company's board of directors. Mr. Loomis is retiring because of ill health.

Mr. Rockhill, the new director, came to Goodyear about fifteen years ago when comparatively a young man. He started at the bottom, working for some time in the factory, but gradually worked up to manager of the auto tire department and later director of sales of the company.

New England Elects Officers

The New England Tire & Rubber Co. has been organized to manufacture the Holyoke cord tire at Holyoke, Mass. Capital is given at $3,000,000. The capital stock consists of $1,500,000 of eight per cent preferred and a like amount of common. The officers are: president, John Kearns, with forty years' experience in the rubber industry, now vice-president and general manager of Lee Tire & Rubber Co. and formerly vice-president of Fisk Rubber Co., and general manager of Dunlop Pneumatic Tyre Co.of Australasia, Ltd.; vice-president and production manager, E. J. Kearns, for seven years with Fisk, three years with Lee, and also with Dunlop of Australasia. The directors include those mentioned and: Joseph F. Ranger, Casper Ranger Construction Co., Holyoke; George K. Clup, formerly with United States Rubber Co., Mid-Continent Tire, and others; T. F. Morris, formerly with American Sugar Refining and Keystone Watch; F. W. Callahan, Springfield, Mass.; J .Sidney Bernstein, attorney, New York, and Frank J. O'Neil, Holyoke, the new company's attorney.

United States Tire Appointments

The following appointments have been made by Charles J. Butler, whose appointment as second vice-president in charge of tire factories was recently announced by the United States Rubber Company: George W. Seiberling, general manager of tire factories; Erwin Meyer, chief consulting chemist, tire factories; John J. Shea, factory manager, Colt Plant, Revere Rubber Company, Providence, R. I.; A. P. Delahunt, chief accountant, Colt Plant, Revere Rubber Company, Providence, R. I.

J. C. Weston President of Ajax

Announcement is made of the election of Joseph C. Weston as president and general manager of the Ajax Rubber Company, Inc. Following a meeting of the board of directors, Saturday, November 27, Horace DeLisser, chairman of the board made the announcement of Mr. Weston's advancement.

JOSEPH C. WESTON

President Weston came to the Ajax Company as vice-president about a year and a half ago from the United States Rubber Company, with which organization and its subsidiaries he was connected in executive capacities for more than twenty years. Few men are so well known in the tire industry or in the larger automobile field.

Chairman of the Board DeLisser, who has recently been filling the active presidency as well, stated on the occasion of the company's fifteenth anniversary that no changes in policy or personnel were suggested in Mr. Weston's election to the presidency, entailing as it does, for him larger responsibilities, occasioned by the growth of the Ajax Rubber Company, Inc.

New President for Kelly-Springfield

Van H. Cartmell, for the last eighteen years president of the Kelly-Springfield Tire Company, has resigned because of impaired health and F. A. Seaman has been elected to take his place. Arthur Sachs of Goldman, Sachs & Co. has been elected a director in place of Otis R. Cook who has recently resigned.

Norwalk Announces Profits

The Norwalk Tire & Rubber Co., Norwalk, Conn., has issued a report for the eight months ending August 31, 1920, gross sales for that period amounted to $3,048,800. Net profits after all charges but before Federal taxes were $703,807 or at the rate of nearly ten times dividend requirements on the $1,500,000 seven per cent preferred stock outstanding. In addition to the $1,500,000 seven per cent preferred stock there is $1,000,000 common stock outstanding. The company has no funded debt.

Depression in Norwalk's tire business was first reflected in June and gross business declined in July and August. In September, however, the company had one of its largest months and gross business up to October 15 was at the same rate. Gross business from June 1, 1920, to October 15 shows a thirty-eight per cent increase over average monthly business from January, 1915 to December, 1919.

The consolidated balance sheet as of August 31, 1920, follows:

Assets: Cash $102,142; trade acceptances, notes and accounts receivable $910,561; merchandise inventory at cost $1,942,785; Liberty bonds at par and accrued interest $55,863; plant equipment, etc., after depreciation $696,572; deferred charges $201,693; leaseholds and good will $700,000; investment Norwalk Tire & Rubber preferred stock $59,800 and common stock $5,000; miscellaneous $9,921; total $4,684,337.

Liabilities: Notes payable $315,000; trade creditors $307,937; taxes and accrued accounts $108,724; purchase money mortgages $3,000; tire mileage guarantee $61,551; preferred seven per cent cumulative capital stock $1,500,000; common stock $1,000,000; reserve for redemption of preferred stock $59,800; surplus $1,328,325; total $4,684,337.

No provision has been made in the above for 1920 Federal taxes.

Mexican Crude Rubber Meeting

A special meeting of stockholders of the Mexican Crude Rubber Campany has been called for December 14 at the offices of the company, 668 Penobscot building, Detroit, for the purpose of reducing the authorized capital from $1,500,000 to $750,000 and to authorize the distribution pro-rata among the stockholders of 375,000 pounds sterling of British government 4 per cent fund loan bonds of July, 1919, held as capital assets. Transfer books of the company will be closed from December 4 to December 14. These bonds were a portion of the proceeds of the sale of the far eastern rubber properties of the company.

Pennsylvania Declares Dividend

At a meeting of the board of directors of the Pennsylvania Rubber Company, Jeannette, Pa., held on November 24, 1920, the regular quarterly dividend of 1¾ per cent on preferred stock and 1½ per cent on common stock was declared payable December 31, 1920, to stockholders of record December 15, 1920.

European Demand for Tires

Just off the boat from Europe, L. H. Mayan, manager of foreign branches of the Lee Tire Rubber Co. declares that there is a greater future for American-made tires on the European market than for American automobiles. "At present, says Mr. Mayan first class European cars built for long and durable service are far cheaper on the home market than are American cars. It is almost impossible to renew broken parts for American made cars in Europe which does not add to their popularity. .The Ford car is of course an exception."

"With American tires it is different. The American tire has always compared favorably with the European product and just at this moment is of superior quality as the European tire factories do not possess as fine a quality of the raw material owing to post-war conditions.

"As in the United States, the European market is rather overloaded with American tires. During my visit abroad, I visited twelve countries and realize that there is a promising future for American made tires if we can neutralize the handicap that European tires are largely sold on the installment plan by proving the durability of our products in this line. The American system of demanding cash in advance from the European dealer must be adjusted very soon by the more prevalent establishment of foreign depots by various makers to take the load of overstocking off the shoulders of the dealer by enabling him to secure smaller parcels of stock as required without long delays and to attend to many adjustments now impossible."

Mr. Mayan reports that the foreign business for Lee tires has increased 215 per cent during the past year. With but two years in the foreign field, Lee tires are already represented in thirty-five different countries of the world and even to Bolshevik Russia have made a considerable shipment.

Predicts Prosperity for the Industry

Optimism for the future of the rubber industry is being manifested by the great majority of executives to-day. Recently Seneca G. Lewis, vice-president and general manager of the Pennsylvania Rubber Co., Jeanette, Pa., issued an interesting statement regarding the future. Mr. Lewis said:

"During the month of July, and even as late as August, tire manufacturers occupied a position of comparative isolation as representatives of the one big industry, showing a conspicuous preponderance of finished goods as compared to current demand. Later developments clearly indicate that a sudden and decisive slowing up in the production of motor cars emphasized at an early date conditions in the tire business, which are now manifest in practically all lines, and there will probably from now on be less inclination on the part of financial authorities to single out the motor and allied industries as the vulnerable spot in present developments.

"While it is not pleasant to find necessity for extraordinary selling effort, it is doubtless fortunate that the tire industry was one of the first, if not the very first, representatives of big interests to find necessity for taking its own temperature. Convalescence may occupy the period of our mid-winter season, but the demand by April or May next will be greater than ever, because granting that necessity for economy inclines some to more conservative use of the motor car, the fact remains that, according to the monthly production figures of Ford and other representative car manufacturers, there are for every motor which may for any reason be relegated to dead storage, scores of new cars are being daily placed in service.

"The tire business is all right. Excess enthusiasm, generated by unusual conditions, prevaling for some four years back, has earned tire manufacturers the period of introspection which is now upon us. Even at this moment the demand for tires for Ford cars and other sizes, especially popular, is so great as to require in our plant maximum production and daily express shipment to branches."

Goodyear Trade Acceptance Plan

Announcement of Goodyear's 1921 trade acceptance plan, believed to be the first of its liberal type offered by any tire company, will be of interest to all dealers. The distinct advantages to the dealer are these:

He may, under the plan place one, two or three trade acceptances with his salesman under the following arrangement: Shipments in November, payable by trade acceptance due March 10, 1921; shipments in December, payable by trade acceptance due April 10, 1921; shipments after January 1, payable by trade acceptance due May 10, 1921.

Under this arrangement the dealer has the advantage of securing goods under three separate orders, at the same time extending his time of payment and thus leaving his present cash available until that date. In other words his capital does not become tied up as soon as under former agreements.

The trade acceptance covers only standard products. It is a signed agreement to pay for a bill of goods at a specified date, shipment of goods to precede payment by a greater length of time than is usual on regular terms.

Thus the dealer has the advantage of obtaining his stock of goods early, giving him a longer time to sell them, and assures him adequate stock for seasonal requirements without the investment of any money until maturity date.

There is no interest for the dealer to pay and he gets his usual cash discount. The acceptances are payable at his local bank.

Rubber Association Banquet

The Twenty-First Annual Banquet of The Rubber Association of America, Inc. will be held in the Grand Ballroom of the Waldorf-Astoria, New York City, on the evening of Monday, January 10, 1921.

Lee Sales Show Large Increase

Following is a copy of the statement which has been issued to the stockholders of the Lee Rubber & Tire Corporation, Jeanette, Pa.:

ASSETS.		
Cash	$ 414,101.93	
Notes and Accounts Receivable, less reserves	873,451.56	
Inventories	3,607,151.96	
Working Funds at Branches	15,250.00	$4,909,955.45
Plant and equipment		1,513,690.63
Investment, Real Estate		15,000.00
Charges Deferred to Future Operations		52,598.48
Patents, Trade Marks, etc		150,967.19
		$6,642,211.75
LIABILITIES.		
Notes Payable		$ 600,000.00
Accounts Payable	$ 165,148.73	
Miscellaneous Accruals including Taxes	$ 177,463.35	342,612.08
Lee Tire & Rubber Co.'s Employees' Stock Option		15,700.66
Reserves:		
Depreciation of Plant and Equipment	396,661.35	
Adjustment of Tire Claims	84,176.18	480,837.53
Declared Capital in Accordance with Stock Corporation Law of the State of New York	750,000.00	
Stock of the Lee Rubber & Tire Corporation—150,000 shares Working Capital—Being Cash and Book Value of Assets acquired in excess of required declared capital	3,413,591.09	4,163,591.09
Surplus		1,039,470.39
Contingent Liability: Employees' Notes amounting to $225,000, endorsed by company to finance stock purchased by employees.		
		$6,642,211.75

The operating profits for the nine months ended September 30, 1920, before reserves for Federal taxes, were $658,291.74.

Your attention is called to the strong financial condition of the company. Inventories are taken at figures which should cause no undue concern and which show reasonable profits at the present selling price of tires.

Sales for the nine months ended September 30, 1920, are $6,204,586.43, as compared with $5,583,993.23 for the whole of the previous year. However, the current monthly sales are showing a decrease over the corresponding period last year.

Owing to the many unauthorized reports which are being circulated regarding tire companies, your directors have considered it wise to give you the above information at this time, in order that you may be informed as to the true condition of your company at as late a date as possible and as to the true value of your investment.

News of the Rubber Association

Annual Meeting and Banquet to Be Held in New York, January 10, 1920—Proposed Change in Constitution and By-Laws—Directors to Be Elected

Annual Meeting of Rubber Association

The following bulletins relating to the coming Sixth Regular Annual Meeting of the Rubber Association of America, Inc., were sent to members of the Association on December 7:

"Please understand this to be a definite call for the Sixth Regular Meeting of the Rubber Association, to be held in the Astor Gallery of the Waldorf-Astoria Hotel, 34th St. & 5th Ave., New York City, on Monday, January 10, 1921, at 2:30 p. m.

Voting Privileges

"Under the provisions of the Constitution and By-Laws of the association each firm member is entitled to a vote at the Annual Meeting, to be cast by the registered firm representative only, unless his power is delegated to some one in the employ of or acting for the firm member and holding a written proxy.

"The Constitution and By-Laws of the Association provides that affiliated members may not vote for the election of directors nor upon questions which relate solely to the rubber industry itself. On all other matters each affiliated member is entitled to a vote, to be cast by its registered firm representative only, unless his power is delegated to some one in the employ of or acting for the affiliated member and holding a written proxy.

"In view of the fact that at the Annual Meeting on January 10th, balloting for the election of directors will be necessary because ten firm representatives have been nominated by the Committee on Nominations to fill five vacancies in the board, the use of a signed proxy in the event of the inability of any firm representative to attend becomes a more important matter than heretofore. It is hoped that our members will bear this in mind and will be certain to make use of the enclosed proxy, if necessary, delegating authority to the general manager of the association or to some other representative to vote for them in the event of their inability to be present.

"An important change in the Constitution and By-Laws, involving Section 2 of Article XI, concerning the annual dues, is proposed, with the approval of the board of directors of the association, to be voted upon at the annual meeting. The suggested substitute and the present Section 2 are shown on the attached memorandum, for the purpose of comparison.

"The effect of the proposed modification of this section relating to annual dues is to require manufacturing firm members, as a condition to their holding membership to agree to contribute to the income of the association on the basis of a pro-rata fee of a specified number of cents per 100 pounds of crude rubber purchased by them, in addition to the annual basic membership fee and the initiation fee now in effect. In other words, it is proposed to make permanent, as a part of the By-Laws, the equitable basis which has been in effect for the past two years under an arrangement for the voluntary contribution of the fee by manufacturing firm members. The exact amount of and method of collection of the fee is to be under the control of the association membership and subject to change at the regular annual or a special meeting of the association.

"It is believed that the proposed change is justified by the equitable and satisfactory operation of the plan which it is now desired to establish on a permanent basis by making the fee a part of the regular membership dues of manufacturing firm members."

Following is Article XI—Section 2 of the Constitution and By-Laws together with the suggested substitute:

Present

Article XI—Section 2.

Annual Dues. The annual dues for firm members shall be fifty dollars ($50) per annum, for affiliated members twenty-five dollars ($25) per annum, and for associate members five dollars ($5) per annum payable in advance. All dues for members shall become payable on January 1st in each year. Members elected after January 1st in each year shall pay a proportion of the annual dues for the balance of that year beginning with the first of the month following election. Members who fail to pay their entrance fees, annual dues, or other indebtedness within thirty days after the same become due, shall be notified by the treasurer, and if payment is not made within the next succeeding thirty days shall be reported to the executive committee as in arrears, and may, at the discretion of the executive committee, be dropped from the membership rolls.

Proposed Change

Article XI—Section 2.

Annual Dues. The annual dues for affiliated members shall be twenty-five dollars ($25) per annum and for associate members five dollars ($5) per annum payable in advance on January 1st in each year. The annual dues for firm members shall include a basic fee of fifty dollars ($50) per annum payable in advance on January 1st in each year and for all manufacturing firm members an additional pro rata annual fee based upon the amount of crude rubber purchased by each of such members. The rate upon which such pro rata fee shall be based for each year or any portion thereof and the time and method of payment of such fee shall be determined by the association at its annual meeting or at any special meeting duly called for that purpose. Members elected after January 1st in each year shall pay a proportion of the annual dues for the balance of that year beginning with the first of the month following election. Members who fail to pay their entrance fees, annual dues or other indebtedness within thirty days after the same become due, shall be notified by the treasurer, and if payment is not made within the next succeeding thirty days, shall be reported to the executive committee as in arrears, and may, at the discretion of the executive committee, be dropped from the membership rolls.

Election of Directors

Announcement regarding the nominees for election to the board of directors was also made as follows:

The terms of the following named directors of the Rubber Association expire with the Annual Meeting in January 1921: Messrs.:—F. A. Seiberling, H. T. Dunn, C. J. Davol, W. J. Kelly, C. W. McLaughlin.

"The Constitution and By-Laws of the association provides that the nominating committee shall submit to firm members, at least thirty days in advance of the annual meeting, the names of nominees selected by that committee, to be voted upon at the annual meeting for election to the board of directors for a term of three years, viz: January 1921—January 1924.

"In accordance with the provisions of the Constitution and By-Laws, your committee on nominations herewith submits the names of ten firm representatives of firm members of the association as nominees, five of whom are to be elected at the annual meeting of the association in New York City on January 10, 1921: Messrs. F. A. Seiberling, president, The Goodyear Tire & Rubber Company; H. T. Dunn, president, Fisk Rubber Company; John J. Watson, Jr., president, Lee Tire & Rubber Company; F. H. Jones, treasurer, Tyer Rubber Company; W. O'Neil, vice-president, The General Tire & Rubber Company; J. W. Thomas, vice-president, Firestone Tire & Rubber Company; Tracy S. Lewis, president, Beacon Falls Rubber Shoe Company; Horace DeLisser, chrmn. bd. of directors, Ajax Rubber Company, Inc.; J. H. Kelly, vice-president, Hewitt Rubber Company; F. R. Henderson, F. R. Henderson & Company.

"It should be noted that as a result of the policy determined upon by the board of directors there are submitted the names of ten firm representatives(which is twice the number of vacancies in the board of directors) in order that there may be opportunity for selection.

"Attention is directed to the act that five of the major branches of the rubber industry are represented by the list of ten nominees, to wit: tires, mechanical goods, sundries, footwear and crude rubber, and it is suggested that in determining upon the nominees for whom their vote will be cast at the annual meeting, firm members give consideration to the desirability of electing a representative of each of the branches of the industry referred to.

"The vote at the annual meeting will be conducted by the use of regular ballots which will be distributed at the proper time."

Tire Production Statistics

A recent bulletin from the Rubber Association of America states that the association has inaugurated an important statistical service covering the monthly production, shipments and inventory of tires and tubes and the crude rubber and cotton fabric consumed by the tire manufacturing industry during each month. This service has the approval of the Executive Committee of the Tire Manufacturers' Division of the association and will be conducted with the assistance of the members of that division.

The installation of this service will be of considerable value to the industry in that it will furnish reliable and up-to-date data relative to the industry. The bulletin states that the present condition in the tire manufacturing field proves the need of such a service which would allow the individual manufacturer to understand conditions in the trade at large at a glance.

Forms are being sent to all members of the Tire Manufacturers' Division which call for monthly information from each tire manufacturer as to production, shipments and inventory of pneumatic tires, tubes and solid tires, and the amount in pounds of crude rubber and fabric consumed in that production. Each manufacturer is given a code designation and this, in addition to the precautions taken in the office of the association will assure the maintenance of absolute secrecy so far as concerns the confidential information supplied by each manufacturer. It is also stated that manufacturers may be certain that only total figures embracing the individual reports supplied by them will be divulged and that the identity of the company from which any report is received will become known to only one man in the office of the Rubber Association of America.

* * *

The Rubber Association announces that 40 of the larger tire manufacturers have signified their intention of submitting statistics on their tire production and shipments in accordance with the recent bulletin on this subject as issued by the association. The output of these 40 manufacturers represents about 85 per cent of the total tire production in this country.

British Industries Fair

The greatest annual Trade Fair in the world, The British Industries Fair, is to be held the beginning of next year at London and Birmingham from the 21st of February to the 4th of March, and at Glasgow from the 28th of February to the 11th of March.

The procedure followed in other years is to be the same except that the fair is to be considerably enlarged. As usual at Birmingham will be exhibited among other things, india rubber goods of all kinds for industrial and household purposes from the most representative manufacturers of the United Kingdom.

Special staffs are maintained to enable buyers to obtain authentic information on all points of importance as tariffs, shipping and transport, most likely sources of supply not only of articles included in the fair but also of all British products.

Admission will be by invitation only so that bona fide visitors and buyers may have all the attention of exhibitors. The British Consulate General, 44 Whitehall Street, New York, will be glad to issue cards of invitation, and also to give all possible information and assistance to prospective visitors.

UNCURED GUM STOCK TUBE BLOWN UP—DEFLATED TUBE HELD BY WORKERS IN REAR—AKRON SEAMLESS RUBBER TUBE CO.

Prudential Buys Great Republic

In an item which appeared in the November 10 issue of The Rubber Age regarding the purchase of the Great Republic Tire & Rubber Manufacturing Company, of McAlester, Okla., by the Prudential Tire & Rubber Company reference was made to the fact that Fred A. Seiberling, who heads the new company was connected with the Goodyear Tire & Rubber Co. This statement was incorrect in that Mr. Seiberling has never been connected with the Goodyear Tire & Rubber Co. The balance of the article regarding the purchase was correct save for the above-mentioned detail.

Unique Feature of Dunlop Plant

An interesting and unique feature of the new factory of the Dunlop Tire and Rubber Corporation of America, at Buffalo, N. Y., is a long covered roadway, eighty feet wide and no less than a quarter of a mile long, which is the main artery and thoroughfare of this factory. The plant is like most big tire companies, a little city in itself, and directly through the center of it from north to south, runs this thoroughfare which might appropriately be termed "Dunlop Street". At the south end is the main entrance to the plant, so that arriving employes step directly under cover and pass through the roadway to their respective places in the various manufacturing sections. It is also a thoroughfare for the product in its various stages of completion.

One can easily see the advantages of such a main artery. Looking north the first great unit in the plant is at the left. This is the engineering and research section. Next to it, comes one of the sections for the treatment of raw materials, where the fabric is rubberized; beyond that, a quarter of a mile from the entrance to the covered roadway, is the washing and mixing shop, one side of which is three stories high and which has large store rooms for stocks of the various kinds of rubber used in making tires, both crude rubber in smoked sheets and the rubber which has been mixed with other ingredients in the shop below. This building alone has five and one-half acres of floor space.

On the right hand side are the various fabrication units, each of them a factory in itself over five hundred feet long and in which Dunlop will make solid and giant pneumatic tires for trucks, cord tires for passenger cars in all sizes, including Fords, tires for motorcycles and tubes for all of the pneumatic tires which, by the way, are all cord tires whether for trucks, passenger cars, or motorcycles.

Another interesting feature of the roadway is the arrangement of the plant offices above the roadway—on the second floor, as it were. This is another clever device of the Dunlop engineers and means that the floor space, in the adjacent factory units can be entirely utilized for its primary purpose, and does not have to be diminished or cut up by offices for superintendents, foremen, and other plant executives. The roadway is well lighted by ventilated sky lights throughout its entire length. The plant offices above are connected by enclosed passages and by reason of their location the lighting and ventilation may be described as ideal.

Brazil to Stabilize Rubber

Financial and economic troubles in the Amazon region, due to the fall in the price of rubber, have been put before President Pessoa, of Brazil, by a deputation representative of Amazonian commercial interests, which suggested the taking of measures to stop the fall in the price of rubber and prevent the product being handed over to foreign trusts.

MARKETS

Manufactured Rubber Goods

NEW YORK, DECEMBER 5, 1920

Liquidation in the rubber business continues in many quarters of the trade, but the feeling is constantly improving as the year draws near the end. In the minds of many in the trade, the worst of the readjustment period is over, and better business prospects are seen for 1921. These optimistic members believe that there will be a big revival in trading shortly after the first of the year, early spring being given as the time when this improvement can be looked for.

Rubber manufacturers are steadily getting down to business on the readjustment proposition. Two of the largest companies in the industry toward the latter part of November announced reductions in salaries. In one instance, the reduction was ten per cent. Whether or not the manufacturers intend to take the same action in regard to their factory employes' pay is not known at this time, but such action would be in line with prevailing conditions in the labor market.

Practically all the raw materials used by the rubber manufacturing industry continue in a slump. Crude rubber itself continues weak, but the market is strengthening somewhat with the removal of the weaker holders. Cotton goods of all descriptions are tending downwards, and chemicals and compounding materials are also weaker. The only factor in manufacturing costs, therefore, still remaining to be liquidated is labor.

AUTOMOBILE TIRES

Tire manufacturers are beginning to get ready for next spring's business, several of the leaders making plans to go forward with the season. These makers are allowing consignments of raw materials, which have been held up for weeks past, to come forward to the factories.

With winter weather at hand, the tire business is entering upon the off-season, and busines is expected to remain quiet for the duration of the year, and during the early winter months of 1921. Stocks of tires in the hands of the distributing trade, however, are not large, and it is believed that winter buying will make still further inroads upon the supply in sight.

Retailers are offering tires at the new low prices made possible by recent reductions on the part of the leading manufacturers, and business has shown a slight picking-up following these reductons.

DRUG SUNDRIES

"Hot water bottle season" is getting under way with a rush, according to distributors of these necessary articles, and there is a good volume of business being done on this line. Rubber sheeting is also a good seller at this period of the year. Manufacturers are upholding prices on these two articles owing to the brisk demand.

The drug sundries line has fared much better than other lines of the rubber manufacturing industry, according to an official of a leading company, and prices have not shown such sharp recessions. The price trend on the general line is naturally downward, in conformity with the general trend on all manufactured goods.

MECHANICAL GOODS

The market has not yet come out of its slump, and members of the trade are very glum as far as present business is concerned. Manufacturing is practically at a standstill for the time being, producers being unwilling to continue to operate while prices on all raw materials are headed downward. Under these conditions, the manufacturers of mechanicals are out of the market for supplies. The railroads are buying little hose and belting, but in a hand to mouth manner only. Belting is going slowly, and marine specialties are also dull at the moment.

BOOTS AND SHOES

Shoe business is picking up with the coming of winter weather, but sales of rubber heels continue rather light. Some of the heel manufacturers have put their crude rubber on the market for re-sale, owing to the slow market ruling at the present time on the manufactured product. An immediate improvement is looked for, however, as business is picking up a little both in the shoe manufacturing and repairing industries. Composition and rubber soles meet with a slow demand.

Winter weather had brought out some demand for rubbers, but sales are generally light, buyers taking stocks on a hand to mouth basis.

MISCELLANEOUS

Sales of the numerous lines of automobile specialties put upon the market during the past year have fallen off some, owing to the coming of winter weather and the slowing down of motoring. However, the manufacturers are making plans for next year's business, which is expected to be brisk. The buying movement on rubber toys for the Christmas season is at its height, and the season will end shortly. Sales this year have been fairly heavy.

Cottons, Yarns and Fabrics

NEW YORK, DECEMBER 5, 1920.

Continued depression has ruled in the market for cotton during the past fortnight, spot and nearby options showing particular weakness throughout. Holders of cotton at primary market points have been letting go at 15 cents per pound, and continued selling of this sort is helping to undermine the market still further.

The outstanding factor in the market for the period has been the action taken by British spinners of American cotton, who voted a sharp curtailment in the use of American staple. News of this decision on the part of the Manchester interests precipitated a heavy selling wave in the market, and prices broke sharply.

The situation in Southern producing states brought about by the steady fall in prices is becoming serious. Georgia growers are so alarmed over the situation that they have petitioned the governor of the state to declare a moratorium. Other states, notably Tennessee, Alabama, Mississippi, North and South Carolina, are said to be in a similar position.

Under these conditions, the holding movement on the part of the planters of the South is fizzling. Every break in the market brings out still heavier offerings by the South. Growers are beginning to realize that the market is now in the hands of the buyers, and that buyers' ideas as to prices must be met if business to continue.

Closing prices on the New York Cotton Exchange on December 3 were as follows;

	High	Low	Close
Dec.	15.85	15.40	15.60@15.65
Jan.	15.80	15.24	15.65@15.70
Feb.	.....	.....	15.75 nom.
Mar.	15.92	15.37	15.82@15.88
April	.....	.....	15.90 nom.
May	16.07	15.53	15.97@16.02
June	.....	.....	16.00 nom.
July	16.14	15.60	16.02@16.05
Aug.	.....	.....	15.90 nom.
Sept.	.....	.....	15.87 nom.
Oct.	15.90	15.35	15.75 nom.

Corresponding day in 1919: December, 38.75@38.80; January, 36.80@36.90; February, 35.00 bid; March, 34.25@34.32; April, 33.10 bid; May, 32.40@32.43; June, 31.50 bid; July, 30.95@30.98; August, 29.75 bid; September, 29.15 bid; October, 28.25@28.30.

SEA ISLAND COTTON

Long staple cotton grown in the delta section of Mississippi has declined from $1.15 per pound to as low as 32 and 35 cents per pound under unfavorable mar-

ket conditions. News from the Sea Island growing districts on the Southeastern seaboard is lacking, owing to the quiet market demand. The market is weakening, somewhat, under continued pressure. The crop this year is such a short one that it will not be a factor in the tire fabric market.

ARIZONA EGYPTIAN COTTON

Spinners of the tire fabrics are not in the market for long-staple cotton produced in the Southwest, and the market is in a demoralized condition. Growers in the cotton producing sections of Arizona and California are endeavoring to stave off the inevitable, and are borrowing money with which to finance the picking and storing of the new crop. The growers intend to hold their cotton off the market until prices again go up.

EGYPTIAN COTTON

Buyers here are holding off the Egyptian market, and the history of the cotton trade in Alexandria during the past few weeks has been one succession of declines. The cotton situation in Egypt is said to be so acute that the entire commercial stability of the country is threatened. Stocks of Egpytian held in spinning circles are said to be ample to take care of early requirements when production once again gets under way. Until that time, the spinners will not be interested in further offerings, and the futures market is consequently declining steadily.

TIRE FABRICS

Leading sellers continue to keep all prices withdrawn, and are booking business only by private agreement with the buyer as to the price. However, the amount of the business booked in this manner is said to amount to next to nothing. Producers are shut down to a large extent and do not intend to resume operations until the tire manufacturing industry once again gets under way. Practically all of the business now being done in tire fabrics is with the second hand holders, many of whom have speculative stocks which they are selling at any price they will bring.

HOSE AND BELTING FABRICS

Further price recessions on hose and belting ducks have been made, but practically all of the current business is being with the second hands. Hose and belting hold unchanged at 40 cents per pound. Enameling is lower at a flat price of 50 cents per pound. Shoe ducks offer at the same figure. Single filling ducks are held at 20 cents per yard, with double filling quoted at a range of 22 to 23½ cents per yard.

DRILLS, SHEETINGS AND OSNABURGS

Sheetings are moving in better quantities, but the market has not yet recovered to any extent. Recent additional reduction in prices stimulated the demand to some extent, but the rubber manufacturing trade is not an important buyer. Drills continue dull, and the market is nominally held. A better demand for osnaburgs has developed, but producers are holding the market generally one cent per yard over the prices quoted below, which are those ruling in the second hand market.

TIRE FABRICS

17¼-ounce Sea Island, combed, sq. yd.	Nominal		
17¼-ounce Egyptian, combed	—	@	—
17¼-ounce Egyptian, carded	—	@	—
17¼-ounce Peelers, carded	—	@	—
17¼-ounce Peelers, combed	—	@	—

DUCKS

Belting (pound basis) lb.	.40	@	—
Hose (pound basis)	.40	@	—
*Enameling	.50	@	—
Shoe Dusks	.50	@	—
Single filling yd.	.20	@	—
Double filling	.22	@	.23½

*Price varies according to width.

DRILLS

37-inch 3.25-yard yd.	.10¾	@	—
37-inch 2.75-yard	.13	@	—
37-inch 3.00-yard	.12	@	—
37-inch 3.50-yard	.10	@	—
37-inch 3.95-yard	.09½	@	—

OSNABURGS

30-inch 7-ounce	.10	@	—
40-inch 7-ounce	.11	@	—

SHEETINGS

40-inch 2.35-yard yd.	Nominal		
40-inch 2.50-yard	.15	@	—
40-inch 2.85-yard	.12	@	—
40-inch 3.15-yard	.15½	@	—
40-inch 3.60-yard	.11	@	11½
40-inch 3.75-yard	.10	@	10¼
40-inch 4.25-yard	.08¾	@	.09

Note—In view of the unsettled conditions prevailing in the market at the present time, the prices quoted above are more or less nominal, and are not guaranteed.

BURLAPS
(Carload Lots)

	Cents	Per	Yard
7 -ounce 40-inch	——	@	——
7½-ounce 40-inch	5.10	@	5.15
7½-ounce 45-inch	5.15	@	——
8 -ounce 40-inch	5.25	@	5.50
8½-ounce 40-inch	——	@	——
10 -ounce 36-inch	——	@	——
10 -ounce 40-inch	Nominal		
10 -ounce 45-inch	Nominal		
10½-ounce 40-inch	5.90	@	6.25

* And higher, according to width.

EXPORTS AND IMPORTS

Continued imports of various items in the chemical field are noted, but the quantity is not yet sufficient to have any material effect upon the domestic market. Many of the lots are going direct to consumers, and are not reaching the open market. Buyers generally show a preference for the American goods over the German, owing partly to sentiment, but mostly to the better prices and selling terms on domestic goods.

Export trade continues quiet. Producers and dealers who have been doing business with Cuba are having their hands full over the present situation. The moratorium now in effect upon the "Island Oasis" has completely demoralized business in all lines, and goods shipped from this country are no longer being discharged at Havana. They are either held in port on steamers, or returned to this country.

LITHARGE

General declines in the lead market have taken in litharge, which is now held on a basis of 10½ to 11 cents per pound. This decline was made despite the prevailing scarcity. New quantity prices are as follows; American powdered in casks, less than 500 pounds 14.25 cents per pound; 500 to 2,000 pounds 12.83 cents; 2,000 to 10,000 pounds 12.30 cents; 10,000 to 30,000 pounds 11.87 cents; and carlots, minimum 15 tons, 11.55 cents per pound.

LITHOPONE

Producers of lithopone are holding the market firm, and have enough business to take care of their output at the present time. Some of them are still working on back orders. No restriction in production has been noted in this field, the producers working steadily and storing aside all surplus production for the spring demand.

WHITING

Stocks of whiting are still proving inadequate to meet present demand, and many manufacturers are not in the market for new business, being oversold. Arrivals of foreign continue small, and no relief to the acute scarcity in this country has been effected. Prices are firmly maintained on the quoted basis.

BARYTES

Producers of barytes are seizing upon the present dullness in the market to put their business in shape, and are catching up with their back orders, which had almost overwhelmed them a few short months ago. Some reserve stocks are being accumulated for sale in the spring when lithopone manufacturers are expected to come into the market for additional heavy quantities.

ZINC OXIDE

New low prices have been established by producers of zinc oxide, the decline taking in all varieties. Despite the slack buying from the rubber manufacturing trade, producers of the oxide have been doing a fair business for some time past,

Chemicals and Compounding Materials

NEW YORK, DECEMBER 5, 1920.

When rubber tire manufacturers once again come into the market for chemicals and compounding materials, they will find conditions radically changed. When the rubber trade somewhat abruptly pulled out of the market a few months ago, prices were at their peak and the market was showing a strong tone throughout.

Now the situation is directly the opposite. Cessation of buying by automobile and tire manufacturers coming at the same time put a big dent in business. The situation became still more unfavorable when these two market interests began offering some stocks for resale.

Producers have at last realized that conditions have changed, and that "the buyer is in the saddle." As a result of this realization, the producers have ceased to wait for the buyers to meet their views on the market. On the contrary, sellers are beginning to meet the ideas of the buyers.

Numerous price reductions have been affected since the last report. Perhaps the most important of these has been the series of price cuts put into effect on lead pigments, which have carried the market down. These reductions have been made by the producers with a view towards speeding up demand.

a good export demand having been noted. Officials of leading producing companies assert that the lower prices have been in an effort to meet the spirit of the times for lower quotations on everything.

DRY COLORS

Both factors in the market, buyers and sellers, are playing a waiting game. Consumers are holding off the market in anticipation of materially lower prices when the lack of demand becomes more fully felt. Producers and dealers, on the other hand, are holding their prices firm at listed quotations for the time being, hoping that demand will shortly pick up and lend the market additional strength. Although prices are quoted firm by holders, it is believed that firm bids on several lines would secure price concessions. Manufacturers of blacks are catching up with back business, and are little concerned over present dull demand for spots and prompt shipment goods. Stocks of foreign browns are light, and with current arrivals generally sold in advance, the market is inclined to firmness on all offerings. Blues are quiet, with an easier undertone in evidence. Reds and yellows are quoted slightly easier in spots.

CRUDES

A little improvement in demand for benzol is reported, and the market is firmer, although prices hold quotably unchanged. Export buying is a feature of the market. Naptha demand is routine, and the market is unchanged at 33 to 35 cents per gallon. Continued weakness is reported in the market for xylol, the market holding at 35 to 38 cents per gallon for commercial, with pure quoted at 42 cents per gallon.

Colors, etc.

Current Prices for Chemicals, Fillers,

Acetone, carlots	lb.	.15¾ @	.16
smaller lots	lb.	.16½ @	.17
Acetanilid, C. P., bbls.	lb.	.35 @	.45
Acids, Acetic, 56 per ct.	cwt.	— @	—
Carbolic, C. P.	lb.	.12 @	.16
Muriatic, 20 deg.	cwt.	2.25 @	2.75
Muriatic, 22 deg.	cwt.	3.00 @	3.25
Nitric, 40 deg.	cwt.	7.25 @	7.75
Nitric, 42 deg.	cwt.	8.00 @	8.50
Sulphuric, 60 deg. car lots	tons	17.00 @	—
Sulphuric, 60 deg. car boys		21.00 @	—
Tartaric, crystals	lb.	.64 @	—
Albalith		.07¾ @	.08½
Aluminum Silicate		Nominal	
Aniline oil, bulk basis Contract		— @	—
Imported		Nominal	
Domestic		.25 @	.30
Antimony— Oxide	lb.	.09½ @	.11
Sulphuret, red	lb.	.22 @	.25
Sulphuret, golden	lb.	.28 @	.30
Sulphuret, crimson	lb.	.45 @	.50
Alcohol, denatured, 190 proof		— @	—
Wood, 95 per cent.		1.90 @	1.95
Ethyl, 190 qroof		5.65 @	5.70
Aldehyde Ammonia		Nominal	
Ammonia, powdered		.17 @	.17½
Ammoninm Carbonate, domestic	lb.	.16 @	.16½
Amyl Acetate	gal.	3.85 @	4.00
Anthracene 80 per cent.		.80 @	.85
Anthroquinine, 95 per ct.		2.50 @	3.50
Asbestine		Nominal	
Asphaltum, Egyptian	lb.	.20 @	.25
Domestic	ton	.30 @	.40
Barium, dust		— @	—
Sulphide	lb.	— @	—
Barytes, prime white imported	ton	Nominal	
white, domestic	ton	$35.00 @	40.00
off-color, domestic	lb.	20.00 @	30.00
Southern, f. o. b. mills.		23.50 @	25.00
Western, f. o. b. mills.		23.50 @	26.00
Beeswax		.21 @	.40
Benzidine Base	lb.	1.10 @	1.20
Benzol, 90 per ct.		.34 @	.36
Benzol, pure bulk, 100		.36 @	.40
Blanc Fixe, dry, bbls.	lb.	.05½ @	.06
Burgundy Pitch, dom.	lb.	.08 @	.10
Foreign		.60 @	.65
Blacks, Drop	lb.	.05½ @	.15
Ivory	lb.	.16 @	.30
Carbon, gas, cases	lb.	.12 @	.30
Lampblack, R M.	lb.	.12 @	.40
Mineral blacks	ton	35.00 @	45.00
Blues, Prussian		.90 @	.95
Soluble	lb.	.90 @	1.00
Ultramarine	lb.	.15 @	.50
Browns, Umber, Turkey, burnt powdered	lb.	.05½ @	.07
American, burnt	lb.	.04½ @	.06
Cadmium, sulphide, yellow	lb.	1.50 @	2.00
Carbon, Disulphide, bulk	lb.	— @	—
Bisulphide	lb.	.08½ @	.09
Casein, C. P.	lb.	.35 @	.36
Castor Oil		.14 @	.15½
Caustic Soda, 76 per ct.	cwt.	4.10 @	4.15
Chalk, precipated, extra light	lb.	.05½ @	.06
heavy	lb.	.03¾ @	.04
China clay, domestic	ton	10.00 @	20.00
imported	ton	19.00 @	25.00
China Wood Oil, bbl.	lb.	.14½ @	—
F.o.b. Pacific Coast		.12¾ @	—
Chloroform, U. S. P.		.43 @	.45
Coal Tar Pitch		— @	—
Cottonseed Oil, crude f.o.b. mills	lb.	6.25 @	—
Prime summer yellow	bbls.	9.11 @	—
Dimethylaniline	lb.	.85 @	.87
Elateron		— @	—
Formaldehyde, spot	lb.	.16 @	.27
Fullers Earth, powd., carload lots		17.00 @	—
Fossil flour	lb.	— @	—
Genasco Mineral Rubber		— @	—
Gilsonite	ton	60.00 @	65.00
Glue, extra white	lb.	.35 @	.45
medium	lb.	.29 @	.34
low grade		.21 @	.25
foot stock		.19 @	.22
brown foots		.19 @	.22
common bone		.18 @	.21
Glycerine, C. P. (drums)	lb.	.21½ @	.22
cans		.23½ @	.24
Graphite, flake (bbl.)	lb.	.14 @	.20
powdered (bbl.)	lb.	.05 @	.10
Green, chrome, R. M.	lb.	.42 @	.70
Ground glass (fine)		.03½ @	.04
Hexamethylene	lb.	1.20 @	1.30
Hexamethyenetetramine	lb.	1.62 @	1.65
Infusorial earth, powd'd.	lb.	.02 @	.035
bolted	lb.	.035 @	—
Iron oxide, red, reduced grades	lb.	.13 @	.15
red, pure, bright	lb.	— @	—
Kaolin		— @	—
Lime, hydrated		— @	—
Lead, red, dry (casks)	lb.	.11 @	.11¼
sublimed	lb.	— @	—
white, basic carb.	lb.	.09½ @	.09½
white, basic sulp.	lb.	.10 @	.10¼
Lime flour	lb.	— @	—
Litharge (casks)	lb.	.10½ @	.11
English	lb.	— @	—
Lithopone, domestic, bbls.		.08 @	.08¼
in bags	lb.	.07¾ @	.08
M. R. X.		— @	—
Magnesia, carbonate	lb.	.18 @	.19
calcined light	lb.	.60 @	.65
Magnesite, calcined, pwd.	ton	50.00 @	65.00
Magnesia, Oxide, heavy		— @	—
Light		— @	—
Extra light		— @	—
Napthalene	lb.	.09 @	.12
Nitrobenzol		.13 @	.15
Naphtha, motor gasoline, (steel bbls.)	gal.	.31 @	—
68 @ 70 degress (steel bbls.)	gal.	.33 @	—
70 @ 72 degrees (steel bbls.)	gal.	.39 @	—
73 @ 76 degrees (steel bbls.)	gal.	.41 @	—
machine (steel bbls.)	gal.	.50 @	—
Oil corn, crude factory	cwt.	9.50 @	9.75
corn, ref. (bbls.)	cwt.	15.76 @	—
linseed, (bbls.)		.93 @	.95
In carloads, spot		.86 @	.88
tank cars		.79 @	.81
Oil palm, Lagos	lb.	.09½ @	—
Niger		.08 @	—
pine, yellow	gal.	1.45 @	1.60
distilled	gal.	1.86 @	1.90
rapseed, refined	gal.	1.25 @	—
rapseed, blown	gal.	1.35 @	—
rosin, first rectified	gal.	.71 @	—
second run		.74 @	—
tar (commercial)	gal.	.45 @	.48
Oleum Acid, 20 per ct.	ton	28.00 @	30.00
Orange mineral, Amer.	lb.	.15 @	.15¼
imported		Nominal	
Ozokerite	lb.	Nominal	
Paraphenylenediamine	lb.	2.25 @	2.50
Petrolatum, bbls., amber	lb.	.08 @	—
pale yellow	lb.	.07½ @	.08½
Paranitrosodimethylanaline		— @	—
Parafin, refined, 118 @ 120 m. p.		.10¾ @	.10½
127 @ 129 m. p.		.09¾ @	.10¼
137 @ 140 m. p.		.11 @	.11½
Phenol		.09 @	.12
Pumis		.05 @	.10
Pine tar kiln	bbl.	15.00 @	—
Pitch	bbl.	9.25 @	—
Plaster of paris	bbl.	4.25 @	5.00
Red Tuscan	lb.	.15 @	.25
red (American)	lb.	.12 @	.16
Indian (English)		.14 @	.18
Standard	lb.	— @	—
Rosin (common to good)— 280 lbs.		11.25 @	—
Rotten stone, powdered	lb.	.02½ @	.04½
Rubber, substitute, black	lb.	— @	—
white	lb.	— @	—
brown	lb.	— @	—
Rosin Oil, first rectified		.71 @	—
Second rectified		.74 @	—
Third rectified		.86 @	—
Fourth rectified		.92 @	—
Soda ash, light 58 pct.	cwt.	1.90 @	2.25
Sodium Nitrite ..96@98 pct.		.16 @	.17½
Solvent Naptha, crude, hvy.		.33 @	.35
Soya Bean Oil, bbls.	lb.	.10 @	.12
Sellers, tanks, f. o. b. Coast		.07½ @	—
Stearic Acid, single		.16½ @	—
Shellac, fine orange	lb.	Nominal	
Sulphur Chloride, drums.		.06½ @	.16
Shellac T. N.	lb.	.83 @	.85
Bleached, ordinary	lb.	.80 @	.85
Bleached, boendry	lb.	1.00 @	1.05
Silex (silicia)	ton	35.00 @	40.00
Soapstone, powdered	ton	15.00 @	20.00
Starch, corn, powd.	cwt.	3.76 @	3.80
pearl		3.08 @	3.66
Jap potato, duty pd, lb.		.06¾ @	—
Sulphur, crude	ton	— @	—
100 pounds		— @	—
roll		— @	—
commercial superfine		3.45 @	—
Talc, American		2.75 @	3.25
French	ton	18.00 @	20.00
Thiocarbanilid	ton	30.00 @	—
Toluol, pure, in drums	gal.	— @	—
commercial		.30 @	.40
Tripolite earth	lb.	.30 @	.32
Turpentine, pure gum— spirit	gal.	.01½ @	—
wood	gal.	1.00 @	—
Venice, artificial	gal.	.90 @	—
true	gal.	.15 @	.18
Vermillion, English	lb.	3.00 @	3.10
American		1.30 @	1.35
Vorite		.25 @	.30
Wax, beeswax, crude yel.	lb.	Nominal	
refined		.21 @	.22
Bayberry		.28 @	.29
ceresin, white		.35 @	.36
yellow	lb.	.15 @	.16
Whiting, commercial	cwt.	.14 @	.15
Gilders Bolted	cwt.	1.40 @	—
Paris, white Amer.	cwt.	1.45 @	—
English cliffstone	cwt.	1.50 @	1.60
Xylol (gal.) pure		2.00 @	—
Commercial		.42 @	.45
Zinc Oxide, French process, red seal		.35 @	.38
green seal		.10¾ @	.11¼
white seal		.11¾ @	.12¼
Leaded Grades—		.13 @	.13¼
Commercial, lead free		.09½ @	.10
5 per ct. lead sulphate		.08½ @	.09
10 per ct. lead sulphate		.08¾ @	.08⅞
20 per ct. lead sulphate		.08¼ @	.08¾
35 per ct. lead sulphate		.08⅛ @	.08⅝
Zinc Sulphate		.03½ @	.04¼

Crude Rubber

NEW YORK, DECEMBER 5, 1920

There have been upwards of a dozen failures in crude rubber circles during the past several months, aggregating $15,000,000. The stocks of these dealers have been liquidated, or are now in the process of liquidation. As a result of this removal of weak and burdensome stocks from the market, feeling is much better and the market is firming up.

One large tire manufacturing company a few days ago signified its intention of

allowing 3,000 tons of crude rubber, held here, go forward on shipment to its plant. Other manufacturers are allowing stocks of crude to come forward to their plants in larger quantities than heretofore. This action has given rise to the belief that the makers are preparing their plants for the spring demand, which will set in shortly.

Pronounced improvement in buying of spot crude has been noted during the fortnight. Consumers are taking supplies of spot rubber and storing them away for future use, the comparative cheapness of the spot goods making them a good buy at this time. Trading in futures as a result, is falling off.

One encouraging feature is the fact that there is a little, a very little, simonpure speculating being done, manufacturers taking supplies and storing them away in anticipation of a rise during the coming year. Some covering by short interests is also being done. As a result of these conditions, fully seventy-five per cent of the business now being put through is for spot goods.

Manufacturers of druggists' sundries have been in the market for small quantities of rubber from time to time during the fortnight, some of the manufacturers even buying stocks for their future requirements.

With the heavy spot stocks of crude rubber slowly cleaning up, importers and brokers are looking on the situation with more optimism. Many predict a sharp recovery in automobile tire business after the turn of the year. Practically all of the larger tire companies have managed to weather the storm of adversity which set in toward the middle of the year, and are now making plans to recoup in the active market expected during 1920.

While the undertone of the crude rubber market has, as outlined above, shown more strength during the past few weeks, the improvement has not been great enough to stay the downward trend of prices in the spot market. The decline has carried prices to record low levels on all grades of spots, but the declines for the entire period of two weeks have generally been fractional, as against declines of from 1 per cent to as high as 3 or 4 during preceding fortnightly periods. Some slight advances have been also noted.

In sharp contrast to the trend of the spot market has been the sudden sharp recovery in futures, which has carried the market up 1 cent per pound. Smoked sheets for January-March delivery are firmer at 20½ cents per pound, with January-June shipment quoted at 22½ cents per pound. Smoked ribbed sheets on spot are 1 cent higher at 18 cents per pound.

Ruling prices in the local market for crude rubber at the close of business yesterday were as follows:

Ceylons			
Smoked sheets ribbed, spot	.18	@	—
Smoked sheets ribbed, Jan.-Mch	.20½	@	—
Smoked sheets ribbed, Jan.-June	.22½	@	—
Smoked sheets plain, spot	.16	@	—
First latex pale crepe	.21½	@	—
Amber crepe, No. 1	.16	@	—
Amber crepe, No. 2	.15	@	—
Amber crepe, No. 3	.14	@	—
Clean brown crepe	.14	@	—
Light clean brown crepe	.16	@	—
Roll brown crepe	.13½	@	—
Grand Central crepe	.13½	@	—
Africans			
Rio Nunez string	—	@	—
*No. 1 Benbuella	.11	@	—
*No. 2 Benbuella	.08½	@	—
Paras			
Up-river fine	.21	@	—
Up-river medium	.18	@	—
Up-river coarse	.14	@	.14½
Caucho ball	.14	@	—
Islands fine	.18	@	—
Maderia fine	.23	@	—
Cameta	.13	@	—
Knapsack	Nominal		
Centrals			
Corinto prime	.14½	@	—
Esmerelda prime	.14½	@	—
Miscellaneous			
Guayule wet	.18	@	—
*Balata block Panama	.28	@	—
Balata sheets	.69	@	—
Palembang	—	@	—
Bangermassin	.07½	@	—
Columbian Block Balata	.46	@	—
Prime Pontianac	.07½	@	—

*Nominal

Scrap Rubber

NEW YORK, DECEMBER 5, 1920

There has been a slight revival in trading in the scrap rubber market during the past two weeks, but buyers have taken stocks only in a small way. Most of the buying has centered on auto tires, white, on tire peeling, and on boots and shoes. Reclaimers have taken stocks in small quantities, but buying has not yet become heavy enough to seriously affect spot prices, one way or another.

Stocks continue to accumulate in wholesalers' hands, and dealers have a large supply on hand. Jobbers are not anticipating any marked increase in demand until next spring, when the reclaimers are expected to come into the market for fairly large quantities.

Towns on the Pacific Coast are gathering municipal "tire piles" to be used for raising funds for Christmas relief to the poor. This custom is especially prevalent in California, where no town is too small to have its tire pile, gathered by the police, boy scouts, firemen, American Legion members, etc.

Only three price changes have been made during the fortnight under review, all downward. Boots and shoes are off ¼ cent per pound, at 4.25 and 4.50 per pound. Trimmed arctics are off ½ cent on the inside price. Auto tires are also off ¼ cent per pound, at 1.00 to 1.25 per pound. Other grades hold nominally unchanged.

	Cents per Pound.		
Solid Tires	1.50	@	2.00
Auto Tire Peelings	2.50	@	2.75
Truck Tires	2.00	@	2.25
Black Rubber	1.50	@	2.00
Boots and Shoes	4.25	@	4.50
Arctics, trimmed	3.25	@	4.50
Arctics, untrimmed	—	@	—
Tire—Automobile	1.00	@	1.25
Bicycles, pneumatic	1.00	@	1.50
Mixed Hose	.50	@	1.00
Air Brake	1.50	@	—
Inner Tubes, No. 1	8.00	@	8.50
Inner Tubes, No. 2	5.50	@	6.50
Red Tubes	4.00	@	5.00

American Rubber Patents

ISSUED NOVEMBER 16, 1920

1,358,702—To David R. Bowen, and Carl F. Schnuck, New Haven, Conn., assignors to Farrel Foundry & Machine Co., Ansonia, Conn. Machine for treating rubber and similar material.

1,358,770—To Albert W. Meyers, Milwaukee, Wis. Tire-vulcanizing machine.

1,358,775—To Astrid Oberg, Chicago, Ill. Garment supporter.

1,358,820—To Arthur J. Brown, Union, N. J., assignor to G. & J. Tire Company. Vulcanizing apparatus.

1,358,852—To Frank W. Howard, New York, N. Y. Raincoat.

1,358,888—To Jay Harley Smith, San Francisco, Cal. Retreading mold.

1,358,936—To Lional W. Crompton and William J. Graham, Tampa, Fla. Auto emergency-tire.

1,358,941—To Harold A. Denmire, Akron, Ohio, assignor one-half to General Tire & Rubber Co., Akron, Ohio. Collapsible tire-core.

1,358,962—To James E. McElvain, Springfield, Ill. Pneumatic tire.

1,359,267—To Abraham Mossovitz, Baltimore, Md. Life-preserver.

ISSUED NOVEMBER 23, 1920

1,359,487—To George W. Bulley, St. Joseph, Mich. Tire-vulcanizing mechanism.

1,359,562—To Newton W. Anderson, Worthington, Ind., assignor to Thomas Bemis, Sr., Thomas Bemis, Jr., and Ruth Bemis, trustees for Anderson Steam Vulcanizer Co. Vulcanizer.

1,359,672—To Roy J. Cavalier, Oswego, N. Y. Hose-supporter.

1,359,795—To Wallace Atcheson Delahey and George Whitefield Delahey, Ottawa, Ontario, Canada. Tire-inflator.

1,359,910—To Joseph Nowakowski, Detroit, Mich. Elastic mailed sleeve for tires.

1,359,919—To James Reardon, Bloomingdale, N. J., assignor to American Hard Rubber Co., New York, N. Y. Process of making hard rubber articles, such as combs and the like.

1,359,925—To Alexander C. Schuman, Louisville, Ky. Resilient wheel.

Old Hickory Plant Purchased

The Nashville Industrial Corporation, composed of business men of Nashville, Tenn., have purchased from the U. S. Government, the Old Hickory Powder Plant at Jacksonville, Tenn., located twelve miles east of Nashville on the navigable Cumberland river. The purpose of the Nashville people is to industrially develop this immense war undertaking into a large manufacturing center, having available immense housing and manufacturing buildings and facilities. The village had a population of 35,000 when the plant was closed in 1918, and is now completely equipped with all necessary public utilities, schools, banks, club houses etc., and offers many attractive inducements to new industries or those desiring a change in their location.

This was the largest government manufacturing undertaking during the war and cost over $87,000,000. It occupies 5,100 acres of land, has a water filtration system capable of supplying a city the size of Boston, one of the largest steam power plants in the world. A double track railroad connecting with trunk lines, thirty-five miles of industrial track connecting manufacturing buildings, an immense refrigeration system, complete water works, sewerage system, fire departments, concrete and macadam roads.

Agree on Chemical Merger

The committee in charge of the consolidation of General Chemical, the Solvay Process Company, Semet-Solvay, The Barrett Company and National Analine and Chemical announced December 1st. that consolidation has become operative. The plan will be carried into effect as of January 1, 1921.